

# THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

---

VOL. XIII.

APRIL, 1896.

NO. 2.

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ON THE FLORIDA GROUND OWL (*SPEOTYTO FLORIDANA*).

BY WILLIAM PALMER.

*Plate II.*

UNIQUE, even among the many unfamiliar birds that a northern visitor sees in Florida, it is not strange that this bird should be always known, wherever it is found, by the distinctive appellation that I have used above and not by the usual *book* name of Burrowing Owl.

The habitat of the species lies some distance off the usual course of tourist travel, and to visit their haunts one has to tramp many miles over otherwise very uninviting prairie; thus few visitors to Florida have ever seen the birds, and even among the residents very little information can be obtained regarding its distribution and habits.

The Ground Owl is found in varying degrees of abundance throughout the central prairie portion of the southern half of the State, from Lake Kissimmee southward through the Kissimmee Valley. Westward its range extends as far as the prairies allow, even in the southwestern portion, to the vicinity of salt water. In some localities they are quite common, while elsewhere,

where the conditions are apparently similar, few or none can be found.

Of the bird but little concerning its habits has been written; few naturalists having had the opportunity of seeing it alive, and then only for a very limited time. Mr. S. N. Rhoads,<sup>1</sup> Mr. W. E. D. Scott,<sup>2</sup> and Mr. Walter Hoxie<sup>3</sup> are the only writers who have recorded any extended experience with the species. Some additional information is also given by Major Bendire.<sup>4</sup>

During March of last year, in company with Mr. Robert Ridgway and Mr. E. J. Brown, I collected a series of these owls from about the central part of the western bank of Lake Kissimmee and on both sides of the Kissimmee River in Polk and Osceola Counties to near Fort Kissimmee in De Soto County. No eggs were found, our last date for collecting the birds — March 20 — showing several burrows nearly finished.

Upon comparing the papers of Messrs. Rhoads and Scott various contradictions and agreements regarding their observations of the local habitats and habits of these birds will be noticed. They appear each to have found the birds in quite different situations, hence the differences between their observations. My own journey took me over both kinds of ground mentioned by these writers, and I am thus enabled to agree with both as to the correctness of their statements and to present something additional. Both writers, Mr. Rhoads especially, have given very interesting and perfectly correct descriptions of the peculiar topography of the region inhabited by these birds, and I shall content myself by adding but slightly to their accounts.

My first meeting with these birds was on the evening of February 26. While walking at dusk toward camp on the sand ridge bordering the shore of Lake Kissimmee, I noticed an owl standing near the mouth of a burrow placed about the center of the ridge *and less than thirty feet from the lake shore*. Almost at the same moment I saw another, its companion, flying low and alighting on

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<sup>1</sup> Auk, Vol. IX, Jan., 1892.

<sup>2</sup> Auk, Vol. IX, July, 1892.

<sup>3</sup> O. & O., Vol. XIV, 1889, p. 33.

<sup>4</sup> Life Histories of N. Am. Birds, No. I, 1892, p. 400.

the short grass a little way out on the prairie. I secured both birds and they proved to be a pair. No others were seen at the time and there was only one burrow at the place. Shortly after daylight the next morning, I again visited the spot, and secured another pair which I surprised out of the *same burrow*. The female of this pair is a very dark bird in fine unworn and unfaded plumage, much darker than any of many specimens subsequently secured (No. 150,150, U. S. N. M. Coll.). A few hundred yards up the same ridge and above our camp, Mr. Ridgway secured three pairs from about five burrows. All these burrows were placed at about the center of the highest and dryest parts of the ridge and were within forty paces of the lake shore. The highest parts of the ridge were hardly four feet above the lake level.

Mr. Scott says<sup>1</sup>: "The highest parts of the open prairie, away from the wooded 'islands,' the sloughs and ponds, seemed to be the places chosen by the birds for their burrows. I found none nearer than a quarter of a mile to any pond or slough." Again he says: "The situation of a burrow was always high, dry ground, and where there was some considerable growth of a kind of huckleberry." He thus found none in low wet places. Rhoads found all his burrows in entirely different situations; as he says,<sup>2</sup> in the "margins of flat, grass-grown sand, of varying width, between the swamp and the saw palmettoes, and extending indefinitely in the direction of the stream." I found burrows and secured birds in both kinds of places mentioned by these gentlemen.

The Kissimmee Valley region is used almost entirely as cattle ranges, and in order to decrease the abundance of dead grass and other undesirable vegetation, and at the same time to increase the possibility of a new growth of grass for the cattle, the cowboys frequently, as the wind allows, set fire to the prairies in many places. Thus during our entire visit we could always see fire or smoke at several points on the horizon. It thus naturally happens that when the sandy areas of the prairies are a little higher and thus drier than the surrounding parts, these frequent fires prevent almost entirely any vegetation from taking root on such places.

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<sup>1</sup> Auk, Vol. IX, 1892, p. 217.

<sup>2</sup> *Ibid.*, p. 4.

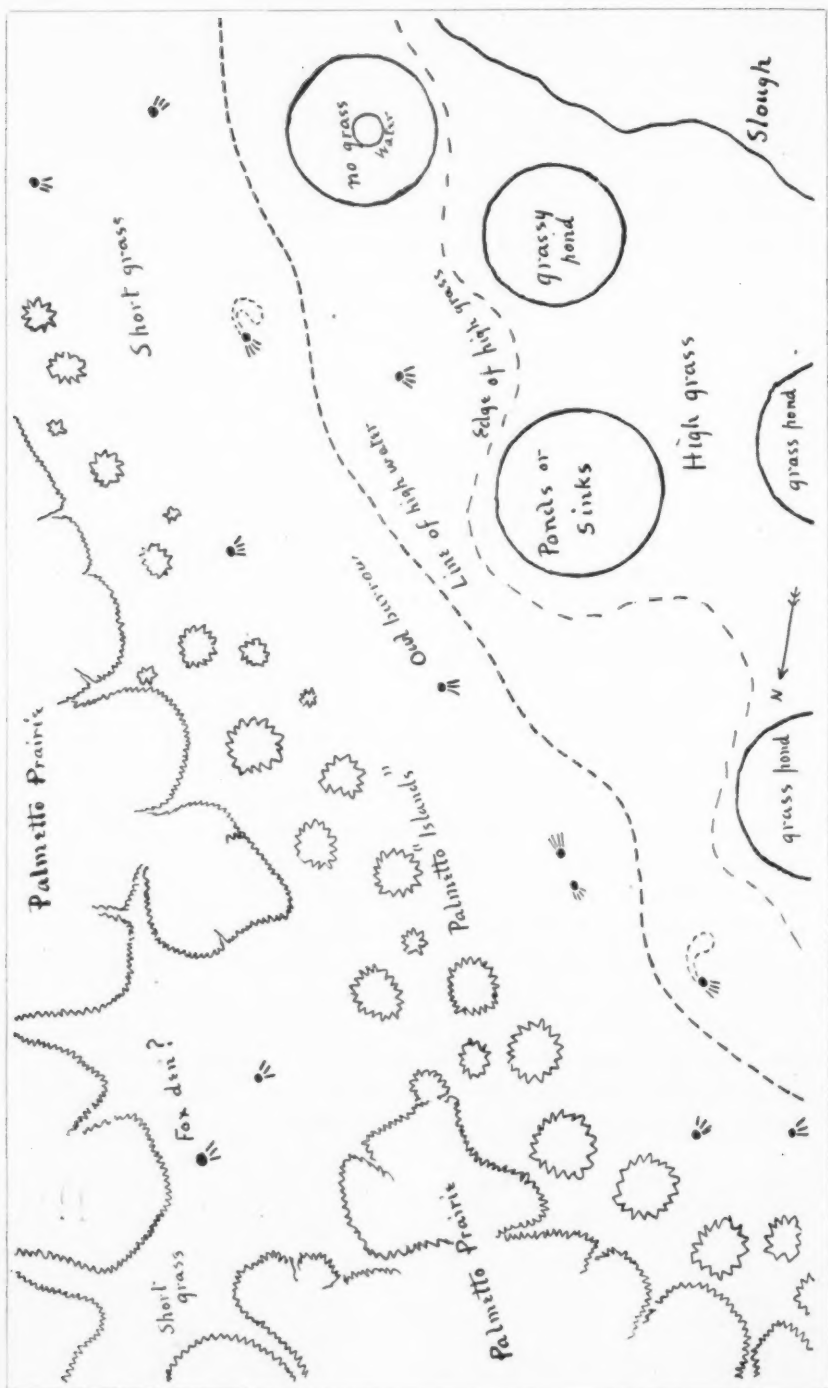


DIAGRAM SHOWING LOCATION OF A COLONY OF GROUND OWLS NEAR KISSIMMEE RIVER, FLORIDA.



These irregular patches of open sandy areas are found in various parts of the prairies but always on the higher ground, though I must confess that these last words seem out of place when describing a country where one can travel many miles without noticing a three foot rise of the ground. Such more elevated ground, when originally overgrown with saw palmettoes, are the usual burrowing places of foxes and skunks. The burning drives out these animals to more secluded quarters, and thus, as I believe, in time the Ground Owls take possession of their burrows. As the bareness of such places increases, other burrows are dug by the owls, thus accounting for the various shapes and sizes of these excavations. The strong odor of the mammals in some burrows from which I had just driven the owls, and their size as compared with burrows undoubtedly dug by the birds themselves convinced me of these facts. Within a few feet of some burrows was a shallower one but a foot or two deep, while about one I noticed a dozen or more shallow depressions, possibly the dusting places of Quails.

The commonest and I believe the original burrows of the Ground Owls are placed, as described by Mr. Rhoads, in the low, wet, grassy areas between the edges of the sloughs and ponds and the margins of the prairies. Such suitable breeding grounds extend for many miles, are rarely more than a few hundred yards wide, and follow the contour line of very high water. The diagram will show the character and general shape of these places. It is drawn from memory of a place near the Kissimmee River in Osceola County, where my friend Brown and myself secured eleven owls out of the burrows represented. On the left is an extensive prairie of scrub saw palmetto interspersed with open areas of grass and ponds with here and there at long intervals an 'island' or 'hammock' composed of two or more cabbage palmettoes, live oaks and gums separately or mixed, scattered or densely crowded, and sometimes growing in the water, but usually on a little elevation surrounded by a ring of water. At intervals through this prairie are the drier elevations before mentioned. At the edge of the prairie are many round 'islands' of saw palmettoes, from five to about fifty feet in diameter, and perhaps four to eight feet high. On the right, at a slightly lower level,

are many circular shallow ponds, usually a hundred or more feet in diameter, while beyond is the slough, extending irregularly parallel with the edge of the prairie.

Between the ponds and the palmetto 'islands' is the line of very high water, an almost flat sandy area densely carpeted with very short grass. About the center of this grassy area are the burrows of the owls, and here we found them in different stages of completion and at very irregular distances. At intervals offshoots of this grassy area extend irregularly into the prairie, and usually contain one or more burrows at or near their centers; in fact it is usual for the owls to locate at a spot about equidistant from the surrounding taller vegetation. In February these grassy flats are very wet, and many of them contain water, but as the water rapidly lowers by drainage and evaporation, the owls select a location and excavate in the wet sand. One place visited on March 4 contained water. On March 15, I secured a pair of birds from a new and unfinished burrow placed near the center and lowest part. The birds also undoubtedly re-use old burrows as was shown by the new deposits of sand on the old hills and through which grass was growing. That the owls dig out their own burrows here is very evident. Many examined on March 20 were in various stages of construction, some just begun, others fully excavated, while a few were finished, as was evidenced by the presence of pieces of dry cow droppings, grass roots and other rubbish in the tunnels and about the entrances of the burrows. Owing to their situation, the high water of the rainy season floods to some extent the sites of these burrows so that the owls are only able to inhabit the locality as the waters are receding. This flood line is shown by the debris of washed up grassy matter, and is indicated on the diagram. Thus at our visits the bottoms of the burrows were in very wet sand; indeed, owing to the flatness and the heavy dews, even the surface sand is very damp. As the season advances the burrows become drier and exactly suit the conditions necessary for the purposes of the birds. The rubbish carried into the excavation also tends to improve its habitable qualities. That the birds were pairing and seeking suitable breeding grounds during our visits is shown by the fact that several times when we secured one or both of the occupants of

a burrow, in a few days (in one case the same night) it was again reoccupied by a pair. Where the owls spend the time between the close of one breeding season and the beginning of another, I am unable to say. That they withdraw from their summer quarters is evident from the statements of people living in the vicinity.

Mr. Rhoads, in his paper cited before, says on page 6: "Every action of this species bespeaks a bird of eminently diurnal habits, but I have no reason to believe that they cannot range with equal freedom at night. From the nature of their food, however, I conclude they are more active in the daytime." Mr. Scott says also in his paper, page 218: "For I believe these birds to be strictly diurnal, doing most of their hunting, however, in the early morning and evening." As these gentlemen visited the haunts of these owls at the height of the breeding season, when many of the burrows contained young, the old owls were evidently forced by the demands of their numerous progeny to hunt in the daytime. In no instance did we find an owl away from the burrows except when frightened off by ourselves. Also I cannot agree with Mr. Rhoads that from the nature of their food they are more active in the daytime. All the stomachs examined contained remains of crayfish and beetles, which are certainly not animals whose season of activity is the daytime. In the tunnel of one burrow I found some feathers of a Savanna Sparrow. In the scratchings from the burrows, especially the old ones, minutely broken remains of crayfish were abundant, and in some cases we found about the mouths of the burrows what were certainly pellets, consisting of crayfish and beetle shells somewhat broken up. The nature of the material, containing no hair or feathers to bind it together, accounts for the rarity of pellets and for the abundance of the scattered remains in and about the tunnels.

Most writers mention that the male usually keeps watch at the mouth of the burrow and on the appearance of an intruder warns his mate with a low note of alarm. This was our invariable experience. My own observations convinced me that in every instance at the time of our visits to the owls (usually in the middle of the morning), the female was in the burrow while the male stood guard in the tunnel at the entrance. Upon slowly and quietly approaching a burrow, which could always be distinguished

by the hillock of usually white sand at one side, the first seen of its occupants was the upper part of the head of one bird intently gazing in our direction. Upon a nearer approach a second head appeared at the burrow side of the first watcher while he moved up a little higher. Getting nearer they would move up more and more, when suddenly the first one, the male, would fly off for perhaps thirty yards. The female would remain a little longer and would sometimes run out of the tunnel and take a position facing us on the opposite side. If we remained stationary both birds would continue together, watching us intently as long as we stood unmoved, but it was always the first watcher that showed the most discretion by putting distance between himself and us upon our closer approach. In whichever direction they alighted they would instantly turn and, facing us, bow with the utmost gravity once or several times, as has been well told by Mr. Rhoads in his paper. If followed and flushed they usually returned to the burrow or some other, but rarely re-entered them unless wounded. In one instance a bird seeing the struggles of its mate flew directly into the burrow and disappeared, but an hour afterwards was found again on watch. A few of the male birds becoming alarmed would fly off into the palmettoes and hide, hence we collected more female than male birds. We saw no birds at work; possibly the female excavates the burrow while the male removes the accumulation of sand to the hillock. I doubt if any work is done while the sun is high.

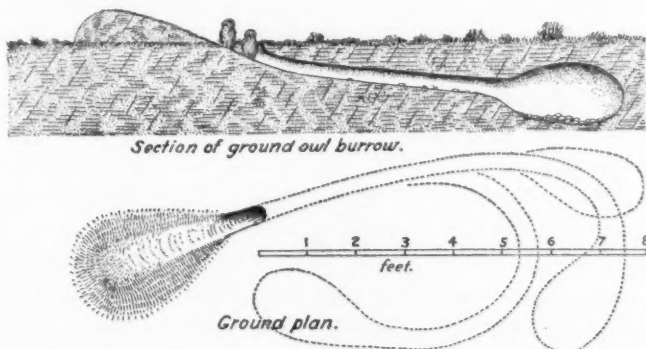
That the males watch all day in the tunnels is perhaps shown by a comparison of the plumage of the sexes. Laying my series of skins in two rows, backs up, each row containing but one sex, it is noticeable at once that the females are much darker than the males (sepia brown<sup>1</sup>) and show extremely little buffy color on the back and wings. The males, on the contrary, are lighter colored (olive with a very slight yellow wash<sup>1</sup>). A few of the darker males approach the paler females in tint, but the darker wings and breast markings of the females readily serve to distinguish the sexes. Several specimens collected by Mr. Brown are quite blackish, but this was evidently caused by the birds having sought

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<sup>1</sup> Ridgway's Nomenclature of Colors.

out beetles, etc., in the newly burnt prairie. Nearly all of the males and but few females show wearing of the outer edges of the secondaries and tips of the primaries and also of the wing-coverts. This wearing of the feathers is evidently caused by abrasion with the sides of the tunnel, and as the male spends most of his time during the day within the narrow limits of the tunnel, and perhaps has frequent cause for moving, it is but reasonable to suppose that his plumage should be more abraded, which is found to be the case upon comparing our specimens. This habit of the males of standing guard in the tunnels undoubtedly results in a bleaching of the plumage. The darkest and finest plumaged birds that we collected are all females, while the lightest colored and most worn and dingy specimens are all males.

There is some difference between the statements of Messrs. Scott and Rhoads regarding the direction in which the burrows open. Those found by us had no regular direction, but more perhaps opened to the westward than to any other point, which was perhaps due to the ground sloping slightly that way. In the diagram (p. 102) the location of a colony of owls is shown by the



burrows being marked as a black spot, the lines radiating on one side representing the direction in which the scratched out materials have been piled. In a few I have indicated the shape and direction of the burrow as examined by us. The distance from the first to the last burrow, as shown on the diagram, is about half a mile. Nearly all the burrows were occupied by a pair of birds, and were in various stages of completion, though none

contained eggs. The birds had evidently selected such a situation not only for ease of digging, but also for ease of observation against their natural enemies, skunks, rattlesnakes and such like. All burrows found except one had no vegetation except short grass immediately about the tunnel. This exception had on one side several tall, thin clumps of bunch grass. The burrows represented in the diagram may, in a sense, be said to form a community, though by using this expression I do not intend to convey any idea that these owls are really gregarious. Usually a community or colony contains about three to six burrows, and generally they are from thirty to over one hundred yards apart, though occasionally two will be found about fifteen or twenty feet from each other. Occasionally, also, a burrow will be seen at a considerable distance from any other, and again, many miles may intervene between colonies; in short, the birds seem to require peculiar conditions of environment, as indicated above, and also to have in slight degree some gregarious feeling, which leads them to locate with their fellows if there is adequate room.

A comparison of the color of the feet of thirteen specimens, all collected at the same place and at the same time, presents considerable contrast. In about half of them the feet and lower portion of the tarsi were uniformly dark and but slightly paler beneath. The remainder showed a variety of changes from one which had the feet and lower third of the tarsi a dullish lemon yellow to the other extreme in which the yellow was confined to the soles. As this color is evanescent it does not show in dried specimens.

My use of a binomial name for this bird requires perhaps some explanation. A comparison of about sixty specimens of *floridana* with an equal number of *hypogaea* shows them to be distinct. As the habitat of the Florida bird does not approach that of *hypogaea* nearer than about eight hundred miles, and is also separated from its relatives in the West Indies and South America by vast areas of water, and as intergrading forms are unknown, I see no good reason why *floridana* should not rank as a species.

Again, as the use of a trinomial implies direct relationship with the specific form, through known intermediate and intergrading specimens, which certainly do not exist in this case, I can see no reason why *floridana* should be made a subspecies of the South American *cunicularia*.



## THE TAXONOMIC VALUE OF THE TONGUE IN BIRDS.

BY FREDERIC A. LUCAS.

A RECENT paper of mine on the tongues of Woodpeckers concluded with the statement that "altogether the evidence favors the view that (external) modifications of the tongue are directly related to the character of the food, and are not of value for classification." Dr. Allen, in noticing this paper in 'The Auk' for October, 1895, says: "Granting that the facts are as stated, we are reluctant to agree with Mr. Lucas's conclusions, for on the same grounds we should have to rule out of the list of taxonomic characters any structural feature adaptively modified to special modes of life, and these involve, in a more or less marked degree, every part of the organism."

In writing thus, Dr. Allen has drawn attention to what is perhaps the greatest of the many difficulties which beset the ambitious taxonomist who would venture upon the classification of birds, since, as Dr. Allen says, every part of a bird's organism, whether external or internal, bears marks of modification for some purpose.

Consequently it is practically impossible to use in classification those characters alone which are due to morphological variations, but it is a truism that those characters which rest on a good morphologic basis should have precedence over those which are solely due to adaptation to some particular purpose. Now it is by no means easy to certainly discriminate between these two things for a physiological adaptation may be of such long standing as to have taken on the guise of structural modification. Thus the absence of a keel to the sternum, the openness of the angle formed by the scapula and coracoid, and the fusion of these last two bones are all secondary characters, and yet they have been accorded a high, if not the highest, rank in classification.

To illustrate the extent to which adaptive features may obscure the relationships of a bird, it may be worth while, for the benefit of the younger readers of 'The Auk,' to recall that on the evidence of the tibia Owen put *Cnemiornis* with the Moas, while Parker, guided by the sternum, assigned it a place near the Rails. Each of these eminent anatomists was led astray by purely adaptive



characters, the development of the legs of this great goose being due to its terrestrial habits, while the abandonment of flight had led to the degeneration of the shoulder girdle and the consequent cutting away and smoothing down of its various prominences, causing an appearance of relationship where none existed.

If habit can thus influence the deeper and more substantial parts of the body, it is only natural to expect that more superficial, softer structures would yield still more readily to external influences and adapt themselves to the requirements of daily life. Among such parts is the tongue, which in the majority of birds is so intimately concerned either in the getting of food or in its subsequent manipulation. Just here it will perhaps be best, in sporting parlance, 'to hedge' a little and to say that I have made only a beginning, and a small one at that, in the study of the tongue of birds, and that I am quite ready to retract my statements in the face of better evidence. At the same time the testimony so far is so completely on one side that it does not seem probable that evidence in rebuttal will be forthcoming. Let it be recalled, too, that it was the *external* modifications of the tongue which were considered to be due to adaptations to food or feeding. As for the hyoid, its modifications, slight though they are, appear to be partly adaptive and partly morphological. For example, while the tongues of Woodpeckers vary immensely in length, and in the extent and character of their barbs and horny papillæ, their underlying hyoids agree in the fusion of the cerato-hyals, the complete absence of a basi-branchial, and the fact that the basi-hyal does not extend to the cerato-branchials<sup>1</sup> which abut squarely upon it. This last might appear a good morphological character were it not apparent that this mode of attaching the cerato-branchials to the basi-hyal is the best possible in a tongue which is used as a spear or probe. And yet we find the same condition in the short tongue of the Rhea, and it is hard to see the adaptation in this case. Also there are many birds, obviously not closely related, whose hyoids are similar, so that we are forced to the conclusion that the value of the hyoid for classification is not very great, and that it must be used with caution.

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<sup>1</sup> "These be hard words, my masters," but unavoidable.

Coming finally to the tongue<sup>1</sup> we would expect, if my conclusion were correct, to find a pretty constant relation between the shape of the tongue and the nature of the food, to find the same general style of tongue in birds belonging to different groups but eating the same kind of food, and, conversely, to find that birds undeniably closely related might have quite different tongues.

The simplest tongues are naturally found in those birds which use them least. In the big-throated Pelicans and Cormorants which bolt their food whole, they are rudimentary, while in fish-eating or flesh-eating birds, they are quite simple. The various groups of Ducks which differ as to their diet possess corresponding differences in the pattern of their tongues. The Canada Goose has a rather simple, flattened tongue, slightly barbed along the edge, while the fish-eating Red-breasted Merganser has the serrations on its slender beak matched by a series of sharp, reverted, horny barbs on the slender tongue, whose obvious purpose is to help in holding and swallowing slippery prey. The Teal and other species of more varied diet, which eat a multiplicity of little things, such as seeds, snails and worms, have a thick, fleshy tongue with several series of slender projections of various degrees of fineness, serving the double purpose of a rake and a sieve. The Honey-eaters have tubular and truly suctorial tongues, formed by the upturning of the edges until they lap, being so closely pressed together that it is a difficult matter to part them. The Meliphagidæ, the Drepanididæ and members of the genus *Cæreba* (formerly *Certhiola*) have a brushy tongue which probably serves to collect pollen, nectar and small insects from the bottom of flowers, and the flower-frequenting Parrots of the genus *Trichoglossus* also have a brushy tongue. In the Ducks then we have a variation in the tongue keeping pace with a variation in the bill of fare, while in the brush-tongued birds just noted we have a similarity of tongue correlated with similarity of food or method of obtaining it. A still better instance of similarity of tongues in widely separated birds, and one in which

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<sup>1</sup> I would like here to express my indebtedness to my friend, Mr. William Palmer, for his kindness in supplying me not only with much material, but information on many points regarding the food and habits of birds.

there seems to be no call for any special adaptation, is that shown by the Swifts and Swallows. Structurally these birds are very dissimilar<sup>1</sup>; the pterylosis, skeleton, muscles and digestive tract of each group has its own distinctive features, and yet their tongues are almost identical, as a glance at the figures (p. 114), where the tongues speak for themselves, will show. More than this, the only Trogon's tongue I have examined is also much like that of the Swallows,<sup>2</sup> and those of *Sayornis* and *Ampelis* are not far removed, so that were birds classified by their tongues all these would be placed near one another. Surely the similarity of all these can scarcely be due to kinship.

On the other hand, the species of the genus *Melospiza* exhibit very considerable differences in their tongues, that of Lincoln's Sparrow being perfectly plain and that of the Song Sparrow the most elaborately fimbriated I have yet met with among thick-tongued birds. The tongue of the Swamp Sparrow is intermediate between the two, though most resembling that of the Song Sparrow. Two specimens of *Melospiza georgiana* are shown, the simpler being from a fresh specimen with a much worn tongue, the other from an alcoholic with a very perfect tongue, and the difference between them is striking, though probably entirely due to wear. I hardly venture the suggestion that the covering of the tongue is regularly moulted, although such may be the case, but it is certainly subject to great changes caused by use. The Woodpeckers have been treated at some length elsewhere, and it is only necessary to repeat that among them the relation between food and tongue seems obvious.

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<sup>1</sup> I do not know whether or not Dr. Sharpe is quite serious when he expresses a wish that some competent anatomist would point out the differences between the Swifts and Swallows, but although I might hesitate to call myself a "competent anatomist," I can readily point out these differences, and would do so most willingly.

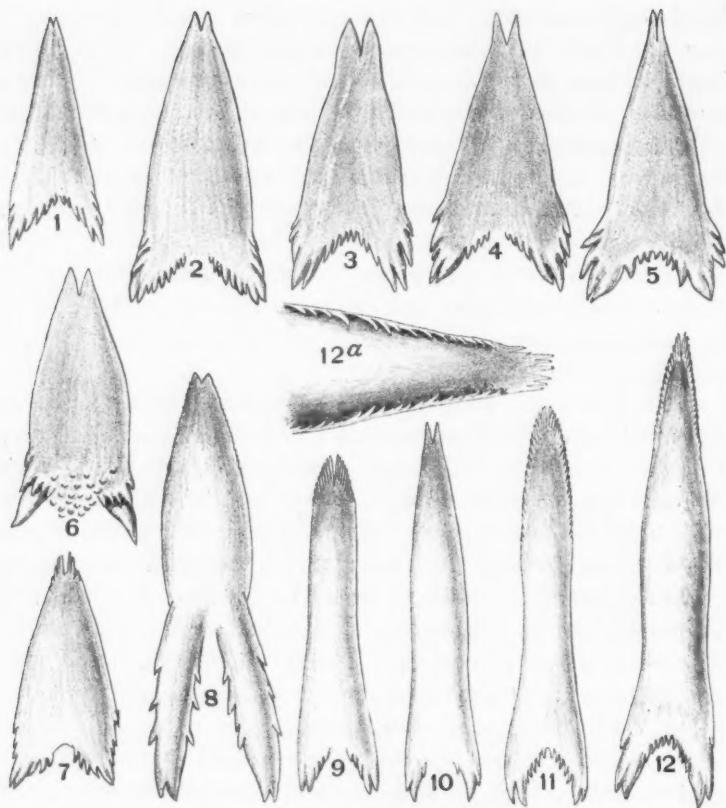
<sup>2</sup> It would be unfair not to point out that there is a decided difference between the tongue of *Priotelus* and that of the others figured. What may be called the primary lateral barbs of *Priotelus* are single, while in the other birds they are double; moreover, in *Priotelus* the primary barbs are overlaid by a second series of smaller barbs, while in the Swifts and Swallows all barbs start from the same level.

All Hummingbirds examined by me, or those whose tongues have been described by others, have identically the same style of tongue, and the members of this wonderfully homogeneous group, so far as I am aware, feed on the same kind of food and take it in the same manner. If any Hummingbird is known to depart widely from his brethren in the character of his food or method of taking it, I venture to say that his tongue will also be found to have some peculiarity.

The facts herein noted are few in number and our knowledge of the tongues and food of birds is far from complete, but, to sum up, what conclusions do we seem justified in drawing from the evidence so far advanced?

If we were to be guided by the tongues as they are found in our North American Woodpeckers, we might say that while they are clearly modified according to food or habits, yet they have a certain taxonomic value, since, in spite of their varied adaptations, it is still possible to recognize each and every one as the tongue of a Woodpecker. If, on the other hand, we based our conclusions on the Swifts and Swallows we would be justified in saying that the tongue is of no value since birds belonging to totally different orders may have precisely the same kind of tongue. Noting the differences that exist between the tongues of *Spinus tristis*, *Passer domesticus*, *Loxia*, *Habia*, and *Melospiza*, we would be forced to conclude that the tongue gives no hint even of family affinities, while a study of *Melospiza* would cast doubts even on its generic value.

But if we find that differences in the tongues of closely related birds are correlated with differences of food, and that birds widely separated by structure, but of similar habits, have similar tongues, and if we find that many tongues of peculiar form seem to bear a direct relation to the nature of the food, I think we are warranted in concluding that the evidence favors the view that modifications of the tongue are directly related to the character of the food and are not of value for classification.



## EXPLANATION OF FIGURES.

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|----------------------------------|--|
| 1. <i>Macropteryx coronata</i> . | 8. <i>Passer domesticus</i> .            |
| 2. <i>Collocalia</i> sp.         | 9. <i>Melospiza georgiana</i> .          |
| 3. <i>Tachycineta bicolor</i> .  | 10. <i>Melospiza lincolni</i> .          |
| 4. <i>Tachornis gracilis</i> .   | 11. <i>Melospiza georgiana</i> .         |
| 5. <i>Hirundo puella</i> .       | 12. <i>Melospiza fasciata</i> .          |
| 6. <i>Priotelus temnurus</i> .   | 12 a. <i>Melospiza fasciata</i> . Tip of |
| 7. <i>Ampelis cedrorum</i> .     | tongue much enlarged.                    |

These figures have been drawn with the camera lucida, all being enlarged to about the same absolute size to facilitate comparison.

[Reference having been made by Mr. Lucas to some remarks of mine on the subject here under discussion, I trust he will pardon me for adding a few words to his excellent paper on the taxonomic value of birds'

tongues, in which he has set forth the subject with great fairness and excellent judgment, and with whose conclusions I fully agree. It seems, however, pertinent to call attention to the fact that what is true of the tongue is equally true of many other parts of the avian structure, as the bill, the feet, the wings, the tail, the sternum, the principal bones of the limbs, various internal organs, etc. In some cases the bill, the foot, or the sternum, as in the case of the tongue of a Woodpecker, would suffice for the reference of the owner to its proper order, or family, or even genus, while in other cases such parts, when isolated from the rest of the bird, would give no certain indication of its affinities. Particularly is this true of the bill, which, like the tongue, is so intimately concerned with the nature of the food and the manner of its procurement. Indeed, in the case especially of conirostral and denti-rostral birds, one might easily be in doubt as to any one of half a dozen quite distinct groups, as witness the old genera *Muscicapa*, *Turdus*, *Fringilla*, *Emberiza*, *Sylvia*, etc., under which species of entirely different families were combined until long after the close of the Linnæan period.

All this simply goes to emphasize again the well-known fact that no single organ, or even a single set of characters, osteological or otherwise, can be taken as the basis of a system of classification, or even be relied on to furnish sure evidence of relationship, unless within narrow limits. Probably Mr. Lucas could quite as easily show that the taxonomic value of almost any other organ was nearly if not quite as small, when taken by itself, as that of the tongue.—J. A. ALLEN.]

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## NOTES ON SOME OF THE BIRDS OF SOUTHERN CALIFORNIA.

BY FLORENCE A. MERRIAM.

THE following notes were made during the spring migration and nesting seasons of 1889 and 1894, at Twin Oaks, San Diego County, California. Twin Oaks is the post-office for the scattered ranches of a small valley at the foot of the Granite Mountains, one of the coast ranges. It is forty miles north of San Diego, and twelve miles from the Pacific. As the surrounding country is mainly treeless, its fauna is restricted, but this valley has a



natural system of irrigation in numerous side cañons that ditch down the spring rains from the hills, and as a result has a rich growth of sycamores and live oaks along the lines of the spring streams, with water near enough the surface to feed the vineyards, orchards and eucalyptus groves, and the grain and alfalfa fields that cover its floor. Moreover, the enclosing hills and the uncultivated parts of the valley are overgrown with chaparral, which offers a cover for many species that would not live out in the open; so that the valley not only affords a rich food supply to a great number of individual birds, but its vegetation is sufficiently varied to attract an unusual number of species for such a small section, in the arid west.

The orchards, eucalyptus groves, grain and alfalfa fields have largely been planted within the last six years, and must exert an important influence upon the future valley fauna. But unless the economic value of the birds is soon demonstrated and understood there is danger that the ranchmen, moved by the too obvious harm the birds do the fruit, may check the incomers or actually exterminate the more obtrusive species.

**Callipepla californica vallicola.** VALLEY QUAIL.—In 1889, Quail were so numerous that the dust of the roads was printed with their tracks, and it was an every-day matter to have them start out of the brush and run ahead of the horses quite unconcernedly, pattering along in their stiff, prim way, with their top knots thrown forward over their beaks. In fact the Quail were so abundant as to be a pest. For several years great flocks of them came down the cañons to Major Merriam's vineyard, where they destroyed annually from twenty to thirty tons of fruit. In one season, July to October, 1881, one hundred and thirty dozen were trapped on his ranch. The result of this wholesale destruction was manifest when I returned to the valley in 1894. The birds were then rarely seen on the roads, and seldom flushed in riding about the valley.

**Carthartes aura.** TURKEY VULTURE.—Mr. W. W. Merriam watched two of the Buzzards eating skunks. They began by pulling the skin from the head and ate till they came to the scent gland, which was left on the ground.

**Falco sparverius deserticolus.** DESERT SPARROW HAWK.—March 30, 1889, a Sparrow Hawk was feeding its mate at the nest. The mouth of the nest was so small that it was difficult for the brooding bird to get in or out. It would fly against the hole and attempt to hook its bill over the edge to pull itself in, but its shoulders were too broad for the space and the only way it succeeded was by raising its claw to clasp the edge of



the hole, by that means laboriously drawing up its body and wedging itself through. June 2, 1894, I found young Sparrow Hawks nearly ready to fly.

**Strix pratincola.** AMERICAN BARN OWL.—April 5, 1889, I found one nesting in the charred hollow of a sycamore limb. Edwin Merriam told me that he had known the birds to change places on the nest in the daytime, and both birds to stay in the hole. They seemed to fly into any dark hole they could find to protect them during the day. A number were found in a partially covered well in the valley, and three were taken from a wind-mill tank in the neighborhood in about a month. In a mine at Escondido a number were found sitting in a crevice where the earth had caved, and about a dozen more at the bottom of the mine shaft, fifty to a hundred feet underground.

**Bubo virginianus subarcticus.** WESTERN HORNED OWL.—Found a nest with young, April 9, 1889. Saw another brooding, April 23, 1894.

**Speotyto cunicularia hypogæa.** BURROWING OWL.—The Owls, besides using ground squirrel holes, built in old badger holes in the red lands of the San Marcos grant. I once saw nine sitting around one burrow.

**Geococcyx californianus.** ROAD-RUNNER.—In May, 1894, I found a nest in a eucalyptus grove, about seven feet from the ground. It was partly lined with horse manure, which I was told the birds often used in their nests in the vicinity. The Road-runner is so protectively colored that when crossing a bare field it does not attract the eye, but when it stops and raises its long neck and tail, it looks like two sticks in the meadow.

**Melanerpes formicivorus bairdi.** CALIFORNIA WOODPECKER.—May 12, 1894, I found a pair of the Woodpeckers nesting. June 16 I heard the weak voices of young. July 6 the old Woodpeckers were found dead and I had the young taken from the nest, apparently just about ready to fly. The old birds were very shy at the nest, but at their hunting ground, nearly half a mile away, where they went to get food for the young, they were indifferent to spectators. They perched on a sycamore limb and made sallies over the alfalfa or out in the air. They also hunted from the posts of the wire fence. They seemed to light indifferently on top of the posts or against their sides, and I often saw them perch on a horizontal limb of the sycamore. They seemed more like Flycatchers than Woodpeckers, they spent so much time on the wing catching insects. In general habits they closely resemble our eastern *Melanerpes erythrocephalus*. Their cries and calls are almost identical.

Edwin Merriam told me that the Woodpeckers excavate nests a foot and a half to two feet deep, often making several elbows, changing the angle to the excavation to follow the soft wood. He said the birds seem to prefer the white oak for building, as for storing acorns; and use the same hole year after year, for the outer shell of the white oak—unlike the live oak—is very durable. The century plant grows wild on the ridges of the hills near the San Luis Rey mission, and he has found the

Woodpeckers filling their stalks with acorns, from six to fifteen feet up. As there were no oaks within five miles, the tall stalks of the agaves were the most convenient storehouses for the birds. In the Julien Mountains he found the pines and the dead deciduous oaks girdled with holes. The Flickers at one time made holes in the thin walls of a neighbor's honey house, and the Woodpeckers used the holes for their acorns. Mr. Merriam was at work in the house one day when they came, and the acorns dropped on the bench by his side. Dozens were also lying on the floor.

**Colaptes cafer.** RED-SHAFTED FLICKER.—April 8 and 18, 1889, I found Flickers excavating nests in sycamores. June 20, 1894, a pair were brooding in a charred hollow of a small oak. One of the sycamore nests was in the under side of a branch that slanted at an angle of forty-five degrees. The Flicker hung with claws planted in the hole, and with its tail braced at an angle under it, leaned forward to excavate. Using its feet as a pivot, it gradually swung in farther and farther; and when it had gone so far that it had to reach back to throw out its chips, it swung in and out on its feet like an automatic toy wound up for the performance. When it had been building for a week, only the tip of its tail protruded from the nest hole as it worked.

One September Mr. Merriam found Flickers storing acorns in the Julien Mountains. He says they often tried several holes before they found one that the nut would fit.

**Trochilus alexandri.** BLACK-CHINNED HUMMINGBIRD.—March 23, 1889, I found a nest in an oak with nearly fledged young. April 2, 1889, found a Hummingbird building in a sycamore, about ten feet from the ground. April 29, 1889, found one building near the tip of a hanging oak branch, about five feet from the ground. April 3, 1894, found nearly grown young in an oak nest fifteen feet above the ground. April 28, 1894, found a Hummingbird feeding young—just hatched—in a nest three to four feet high. May 17, 1894, found one brooding in an oak fifteen to twenty feet from the ground. May 22, 1894, found a nest just begun in an oak four to five feet from the ground. May 26, 1894, found a bird brooding on a nest in a eucalyptus grove, six or seven feet up. June 2, 1894, found a nest being built at the end of an oak spray three to four feet from the ground. June 20, 1894, found a Hummingbird feeding young out of the nest in a eucalyptus grove. The oak nests were in low, hanging, drooping branches or in oak tops. They were made of yellow, spongy down from the under side of sycamore leaves, and when built among green oak leaves had flakes of light green lichen on the outside. The eucalyptus nests did not have the lichen. One of them was fastened on the curve of a drooping branch, and to make it set true was deepened on the lower side so that it measured an inch and three quarters.

The peculiar feature of the building was the quivering motion of the bird in moulding. When the material was placed she moulded the nest like a potter, twirling tremulously around against the sides, sometimes

pressing so hard she ruffled up the feathers of her breast. She shaped the cup as if it were a piece of clay. To round the outside she would sit on the rim and lean over, smoothing the sides with her bill, often with the same tremulous motion. When she wanted to turn around in the nest she lifted herself by whirring her wings.

May 24, 1894, I saw a female Hummingbird sit on an oak twig, while a male, with the sound and regularity of a spindle in a machine, swung back and forth in an arc less than a yard long. He never turned around, but threw himself back at the end of the line by a quick spread of the tail.

May 19, 1894, I saw two different males go through a similar performance, though I could not discover the females. They flew backwards and sidewise, not turning around. They dove with gorgets puffed out and tails spread, making a loud whirring sound. April 26, 1889, while riding along the chaparral, I stopped a few moments and a Hummingbird shot down at my horse, darted up in the air and shot down again about a dozen times. It stopped itself in going up by suddenly closing its wings, then it turned around, opened its wings and darted down, "all sound." When hovering around oak trunks and feeding from flowers, I have seen the birds throw themselves up by giving a toss with their tails.

**Selasphorus rufus.** RUFOUS HUMMINGBIRD.—In April, when the wild gooseberry bushes are in bloom, they are fairly alive with the Rufous Hummingbirds, who find food in the red tubular blossoms. The whizzing and whirring lead you to the bushes from a distance and as you approach, the birds dart out, shoot up into the sky, sweep down and, pell mell, chase after each other through the air. The Rufous Hummingbirds must have been migrants at Twin Oaks, for they disappeared entirely.

**Tyrannus vociferans.** CASSIN'S KINGBIRD.—April 28, 1889, I found a Flycatcher's nest in a sycamore. The birds also built in the oaks near the house, making a bulky untidy nest, with string dangling from its sides. May 30, 1894, a pair were still building in a sycamore. Mr. Merriam told me that when he was plowing and the Blackbirds were following him, two or three of the 'Beebirds,' as he called them, would take up positions on stakes overlooking the flock; and when one of the Blackbirds got a worm that he could not gulp right down, a Beebird would dart after him and fight for it, chasing the Blackbird till he got it away. For the time the Flycatchers regularly made their living off the Blackbirds as the Eagles do from the Fish Hawks.

**Myiarchus cinerascens.** ASH-THROATED FLYCATCHER.—Seen in the chaparral and in the orchards hunting low for insects. Their calls closely resemble those of the eastern Great-crest, *M. crinitus*. Some are like *quir'r'r*, *quirp'* and *quir'r-rhea'*. The bird also says *hip'*, *hip'*, *ha-wheer'*, the *hip* emphasized with a vertical flip of the tail, the *wheer*, with a side-wise dash. The Flycatcher has besides a low call of *hip* and *ha-whip*. Mr. Merriam told me that the birds nest in old Woodpecker holes, and line their nests with hair.

**Sayornis nigricans.** BLACK PHŒBE.—April 30, 1889, I found three eggs in the nest of a Black Phœbe five feet down in a deserted well. Before the eggs hatched, a pump was put down the well and water pumped up every day, but the birds did not desert the nest. In 1894 a pair of Phœbes built inside a whitewashed lath chicken house. The nest, made of large pellets of mud like a Swallow's, was plastered against a board in the peak of the chicken house.

**Contopus richardsonii.** WESTERN WOOD PEWEE.—June 29, 1894, a Wood Pewee was brooding in a small oak, having moved from its first attempted nest in the top of a high oak, probably driven away by Blue Jays.

**Aphelocoma californica.** CALIFORNIA JAY.—The flight of these Jays is often undulating. Mr. Merriam told me that he had frequently seen them carrying acorns. One year they took them from the oaks by the house to a side cañon half or three-quarters of a mile distant. Forty or fifty of them were at work, straggling along a few at a time, all day long for a period of a week or more. Sometimes they had two acorns in their bills. In Moosa Cañon the Jays carried the nuts from the bottom of the cañon to the sides of the hills above; and at another place, near Ocean-side, they carried them four miles, from the oaks of the valley to the chaparral of a mesa.

**Xanthocephalus xanthocephalus.** YELLOW-HEADED BLACKBIRD.—I saw large flocks of them on the mustard seven miles west of the valley, and found one in the vineyard with Brewer's Blackbirds and Redwings.

**Icterus cucullatus nelsoni.** ARIZONA HOODED ORIOLE.—April 23, 1889, a pair were building in an oak beside a ranch-house. They made their entire nest of the orange-colored parasitic vine, the dodder of the meadows.

**Scolecophagus cyanocephalus.** BREWER'S BLACKBIRD.—They usually began building about March 25. They nested familiarly in the oaks beside a house and also in sycamores. When the vineyard was being cultivated, all the Blackbirds of the valley, both Brewer's and Redwings, assembled to follow the plow.

Mr. Merriam told me that he had seen flocks of perhaps five hundred Blackbirds, of both species, fly down and light upon the backs of a band of grazing sheep. At such times a few of the birds would pick out wool for their nests, bracing themselves on the backs of the sheep and pulling where the wool had been loosened by the scab. He had also seen the birds ride hogs, horses and cattle, but he said the horses usually switched them off.

**Carpodacus mexicanus frontalis.** HOUSE FINCH.—The commonest bird in the valley, building about the houses more familiarly than Robins.

**Chondestes grammacus strigatus.** LARK SPARROW.—Seen frequently in the orchards. Its song resembles that of the Song Sparrow, but is richer and has a purring quality that characterizes it. Saw one carrying building materials, April 9, 1889.

**Habia melanocephala.** BLACK-HEADED GROSBEAK.—The Grosbeak has a marked habit of song flight. At its best, with the exception of the

Thrush, his song excels that of any bird I have ever heard. It is singular in its exquisite finish, and remarkable for its rich musical quality. It is a long song, greatly varied. It begins with the ordinary Grosbeak swinging pendulum phrase which is followed by a soft low measure, after which the pendulum and the low phrase are repeated. Then come a series of thrills preluding the most beautiful part of the song—a clear tender whistle, each note of which is drawn out so slowly and is so liquid and well rounded that it seems as if the bird were consciously perfecting it. Sometimes after this the Grosbeak, with a grace note, goes on to a final low trill and whistle; and then, after a momentary pause, begins all over again.

**Passerina amœna.** LAZULI BUNTING.—April 30, 1894, I found a pair building in the mallows. May 12, the female was brooding. May 29, the male was feeding the young. May 30 the nest was empty. June, 1894, I found a Lazuli's nest, made largely of oat stalks, in a tree in a eucalyptus grove, a great contrast to the gray nest in the weeds out in the fields.

**Petrochelidon lunifrons.** CLIFF SWALLOW.—Saw a large number of them getting mud from a temporary pond early in April, 1889.

**Lanius ludovicianus excubitorides.** WHITE-RUMPED SHRIKE.—April 10, 1889, there was one egg in a nest made in a clump of willows. June 1, 1894, a pair were feeding young in a nest made in a ball of mistletoe in the top of an oak. June 16, I found a family of young being fed in the chaparral.

**Helminthophila celata lutescens.** LUTESCENT WARBLER.—A very quiet minute workman, hunting among the golden tassels of the oaks with whose color it harmonizes perfectly. It will lean over the tip of an oak bough to examine a tassel, stretch up to reach a blossom hanging over its head, hop along a twig, and then flit up to cling head down to a spray of leaves, or flutter like a Hummingbird under a yellow tassel.

**Dendroica auduboni.** AUDUBON'S WARBLER.—One of the most abundant birds in March. It is as restless and active as the eastern *D. coronata*.

**Harporhynchus redivivus.** CALIFORNIA THRASHER.—April 29, 1889, I found a family of young, three quarters grown. In song and general habits the Thrasher is much like our eastern *H. rufus*. The bird uses its curved bill most skilfully. Instead of scratching with its feet as the Chewinks and Sparrows do, it uses its bill almost exclusively. I once watched one hunt for food. It cleared a space by scraping the leaves away, moving its bill through them rapidly from side to side. Then it made two holes in the earth, probing deep with its long bill, and after taking what it could get from the second hole returned to examine the first one as if to see if anything had come to the surface there.

**Thryothorus bewickii spilurus.** VIGORS'S WREN.—April 18, 1889, a pair of these Wrens had young in an old nose bag hanging on a peg in a shed. April 23 a Linnet's nest with one egg was in the nose bag on top of the dead nestling Wrens.



*Troglodytes aëdon aztecus*. WESTERN HOUSE WREN.—April, 1889, I found a number of nests in sycamore holes and about buildings. One was in a grape crate, and twigs were strewn loosely over one end of the box, covering a space nearly sixteen inches square. The compact high body of the nest measured eight by ten inches, and came so near the top of the crate that the birds could just creep in under the slats. Some of the twigs were ten inches long. April 28, 1894, I found a pair of Wrens carrying twigs to a sycamore hole. June 4 the young were being fed rapidly; but the birds did not leave the nest till June 16. Both the old birds had a striking habit of moving their wings tremulously at their sides, and sometimes the male, when singing to his mate, would raise his quivering wings till they almost met over his back.

*Parus inornatus*. PLAIN TITMOUSE.—March 24, 1889, I found a pair building; on May 12, they were feeding the young in the nest. June 15, 1894, I saw a pair feeding young out of the nest. The nests I found were in the crack of an oak, about four feet from the ground, and in the under side of a decayed branch, fifteen or twenty feet above the ground. When hunting, the birds flattened their high crests to small points at the back of the head.

*Chamæa fasciata henshawi*. WREN-TIT.—April 3, 1889, I saw two Wren-tits carrying material, but could not find their nest. June 8, 1894, I saw a family of young in the brush. The birds live in the cover of the chaparral. Their long tails tilt up and down as they fly, and sometimes rise over their backs when they light. In looking for food the Wren-tits often hold their tails up and hunt in the careful way of the Wrens. Their scold, which is a loud chatter, is also wrennish in character.

The song is the most striking thing about the Wren-tit. From it the people of the valley call him the 'scale bird.' He is not seen unless you go to the brush to look for him, but wherever you are you will hear the clear ringing voice running down the scale, the bell-like tones now coming from the chaparral of the valley, now from the bowlder-strewn hillsides above. The Wren-tit seems timid about singing in sight and it was a long time before I connected the quiet obscure bird with the loud beautiful voice. But one day when watching a Wren-tit it puffed up its throat till its feathers stood out in layers, and brought out the slow distinct notes of the descending scale, its tail shaking with each note.

Although the general character of the song remains the same, it varies somewhat in the notes and their relative rapidity. I have heard the whole song given on one note, the first four uttered very slowly, the last four faster, but a commoner form has nine notes, the last five running down the scale. At times the first four notes are given alone, as *keep, keep, keep, keep*; at others, as two syllables, *keep'-it, keep'-it, keep'-it*—three repetitions of the same note. A common form is a scale of seven two-syllabled notes—*tip'-it, tip'-it, tip'-it, tip'-it, tip'-it, tip'-it, tip'-it*. Again one hears a combination of the one and two-syllabled notes, the first four on one

note, the rest going down the scale, as *keep, keep, keep, keep, keep'-it, keep'-it, keep'-it*. There is also a rapid run with a rolled *r*.

The Wren-tits are hard birds to study because it is so difficult to penetrate the brush where they live; but one gets occasional glimpses of them outside. I once saw one break up a Gnatcatcher's nest in an oak on the edge of the chaparral, and afterwards came on one that was persistently feeding the fledgling of a Lazuli Bunting, although both parent birds were on the spot.

***Psaltiriparus minimus californicus*.** CALIFORNIA BUSH-TIT.—In March and April, 1889, and April, 1894, I found a number of the birds building. One of the nests I was watching pulled down of its own weight, closing in the entrance. Its wall, made of fine gray moss and oak blossoms, was half an inch to an inch thick, and had a wadding of feathers inside. I counted three hundred, and there were a great many more. There must have been several dozen chicken feathers, each from two to three inches in length. The builders profited by experience in an interesting way. Their second nest, to begin with, was not nearly so long as the first one, although that may have been from the additional labor the extra length would entail. They hung the nest between the forks of a twig whose cross twig could support the top. At first they put the entrance about half an inch below this supporting cross twig, but afterwards moved it up above the twig so that the roof could not possibly close the hole as it had done in the first nest. This time the hole itself, which was usually the girth of the bird, was made much larger than in the old nest. The birds used the materials of the deserted nest to make the new one. In building, they began at the top of the open pocket — at the cross twig — leaving the roof till the last, though they made the first entrance while the lower part of the nest merely hung in loose fibres — was not formed at all. In making the body of the pocket they would light on the cross twig and swing themselves down inside, hanging by their claws while they placed their material and moulded and shaped the pocket from the inside. When the nest was completed it had a quantity of brown oak tassels around the entrance, which was finished neatly with lichen.

The Bush-tits are rapid workers. I found a nest begun one day, only a filmy spot in the leaves, and the next day it had grown to be a gray bag over eight inches long, though I could still see daylight through it. The birds work together and give their fine call of *schril, shril*, as they go and come about the nest. Their long tails give them a long tilting flight. The Bush-tits are very abundant at Twin Oaks. I have often found two of their nests in one oak. In 1889 I found eight nests in oaks, from seven to fifteen feet from the ground, but none in 'low bushes.' Mr. Merriam told me that out of dozens of nests, he had found only one in a bush. He thought the live oak nests averaged from eight to nine feet from the ground. He said the birds often weighted the nests with sand and sometimes built a projecting roof over the entrance.

***Poliophtila cærulea obscura*.** WESTERN GNATCATCHER.—April 29,



1889, I found a nest in a small oak, containing two eggs. May 4, 1894, I found a pair brooding. May 16, a pair were building in an oak, fifteen to twenty feet above the ground. May 28, the birds seemed to be through building and were flitting about warbling and apparently taking a rest before time to begin brooding. May 31, after a Blue Jay had created an excitement in the oak, the Gnatcatchers began taking their nest to pieces, and went to work putting it up in a low oak a few rods away. June 7 the birds were still building. June 11 they were brooding, changing places in the nest. June 25 the young were being fed. July 4 the young were out, being fed in the brush. From May 16, or more accurately May 14—for the nest had been begun at least two days before I found it—from May 14 to July 4, those birds were working to get one brood launched. The first nest took them two weeks, the second one about ten days. Their method of work was interesting. The nest was laid on a horizontal branch. Their plan seemed to be twofold, to make the walls compact and strong by using only fine bits of material and packing them tightly together—drilling them in—and at the same time to give the walls form and keep them trim and shipshape by moulding inside and smoothing the rim and the outside. Sometimes the builder would smooth the brim with its neck and bill like a Redstart, as a person sharpens a knife on a whetstone, a stroke one way and then a stroke the other. The birds usually got inside to work, but there was a twig beside the nest that served for scaffolding, and they sometimes stood on that to work on the outside. They both worked, flying rapidly back and forth with material. The second nest rested lightly on a horizontal limb, but was supported mainly by two twigs which forked so as to enclose it. It was a beautiful nest, covered with lichen and lined with feathers. The birds were not at all shy. They let me come so near that I saw the black lines bordering the blue forehead of the male.

*Sialia mexicana occidentalis*. WESTERN BLUEBIRD.—Mr. Merriam told me he had seen the Bluebirds build in the mud nests of Swallows in trees; but most frequently in knot holes and in the abandoned nests of the small Woodpeckers.

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## THE LAW WHICH UNDERLIES PROTECTIVE COLORATION.

BY ABBOTT H. THAYER.

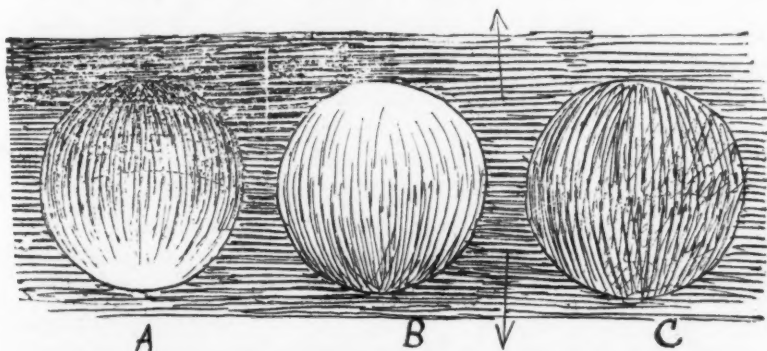
THIS article is intended to set forth a beautiful law of nature which, so far as I can discover, has never been pointed out in print. It is the law of gradation in the coloring of animals, and

is responsible for most of the phenomena of protective coloration except those properly called mimicry.

Naturalists have long recognized the fact that the coloring of many animals makes them difficult to distinguish, and have called the whole phenomenon protective coloration, little guessing how wonderful a fact lay hidden under the name.

*Mimicry makes an animal appear to be some other thing, whereas this newly discovered law makes him cease to appear to exist at all.* The following are some examples of true mimicry. The Screech Owl, when startled, makes himself tall and slim, and with eyes shut to a narrow line simulates a dead stub of the tree on which he sits. Certain Herons stretch their necks straight upward, and with head and green beak pointed at the zenith, pass themselves off for blades of sedge grass. Certain harmless snakes spread their heads out flat, in imitation of their poisonous cousins, and rattle with their tails in the leaves. Many butterflies have stone or bark-colored under sides to their wings, which make them look like a bit of bark or lichen when they sit still on a stone or tree trunk with wings shut over their backs.

The newly discovered law may be stated thus: Animals are painted by nature, darkest on those parts which tend to be most lighted by the sky's light, and *vice versa*.



The accompanying diagram illustrates this statement. Animals are colored by nature as in A, the sky lights them as in B, and the two effects cancel each other, as in C. The result is that their gradation of light and shade, by which opaque solid

objects manifest themselves to the eye, is effaced *at every point*, the cancellation being as complete at one point as another, as in Fig. C of the diagram, and the spectator seems to see right through the space really occupied by an opaque animal.

Fig. 1 of a Ruffed Grouse shows this arrangement of color and light. This bird belongs to the class in which the arrangement is found in its simplest form, the color making a complete gradation from brown above to silvery white beneath, and conforming to every slightest modelling; for instance, it grows light under the shelving eyebrow, and darker again on the projecting cheek.

When he stands alive on the ground, as in Fig. 2, his obliteration by the effect of the top light is obvious.

Writers say "he is so nearly like the color of his surroundings that you cannot see him." Fig. 3 is to show that they ascribe the concealment to the wrong cause. I merely took the bird shown in Fig. 2, and accurately tinted his under parts with brown to match his back, and in less degree tinted his sides, till I had reduced him to uniformity of color all over; but I did not, of course, change his upper surfaces at all. In short, I extended his 'protective' colors all over him.

Now observe the effect on replacing him in a life-like position. He is completely unmasked. The reader has but to compare the distance at which he can distinguish a bird in No. 2 and in No. 3 respectively, to see whether simple 'protective coloration,' as ordinarily defined, is the true cause of this concealment, or whether this compound gradation of color and light is the true cause.

Fig. 4 and Fig. 5 show that his colors are powerless to conceal him in any position except the upright one which he holds when alive, and Figs. 6 and 7 do the same for the Woodcock.

In Figs. 5 and 6, notwithstanding the fact that we have even the strongest 'protective' colors towards us, the bird is by no means concealed.

The Woodcock series corresponds to that of the Ruffed Grouse. Fig. 8 shows a female on her nest, very difficult to find. In Fig. 9 the bird has been treated exactly as I treated the Ruffed Grouse in Fig. 3. Observe that she is essentially more conspicuous, though not a feather of her upper parts has been artificially painted.

The reason of her visibility is that I have artificially extended her top colors down her sides, thereby destroying her counter-gradation and forcing her solidity to manifest itself.

The reader, I think, must try these experiments for himself before he can believe that in Fig. 3 and Fig. 9 I tinted the under surfaces exactly as dark as the upper, and no darker. But I beg him to look at any horizontal branch in the woods which is either on the level of his eye or below it. He will see that although it has exactly the color of its surroundings, it is not in the least concealed, because, being of uniform color above and below, like the birds after I had painted their under sides, it wears that universal attribute of a solid, namely, a gradation of shading from its light side to its dark side.

I leave to the reader the pleasure of discovering for himself that this principle of gradation in color is almost universal in the animal kingdom. In certain classes of birds and of flying insects, however, the principle gives place, more or less, to the device pointed out by Bates; namely, the employment of strong arbitrary patterns of color which tend to conceal the wearer by destroying his apparent continuity of surface. This makes, for instance, the Mallard's dark green head tend to detach itself from his body, and to join the dark green of the shady sedge; or the ruby of the Hummingbird to desert him and to appear to belong to the glistening flower which he is searching. Yet many other cases of color applied apparently at random conform essentially to the law stated above. The dark patches are on top, the light ones beneath.<sup>1</sup> The dark breast-mark, so widely used by nature on birds, usually has the effect of putting out a conspicuous and shining rotundity of some bright or light color, as in the Meadow-lark and the Flicker; because it comes just where the breast, in its usual position, rounds upward and faces the sky. The dark collars of the males of most species of Duck are absolute counter-shading to the light from the sky, when the birds sit in their characteristic positions. For most female Ducks

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<sup>1</sup> I have proved, by experiments with painted decoys, that even brilliant top-colors, however strongly contrasted to surroundings, scarcely tend to betray the wearer, if his ensemble be a gradation from dark above to light below.

nature uses the complete gradation, like that of Grouse and Sandpipers. Ground birds in general, such as Grouse, Sandpipers and Sparrows, are usually clothed throughout in colors graded according to this principle. But the males of many species of Pheasant are notable exceptions to this last statement.

Now there is still one more very beautiful phenomenon to record. If the animal itself is obliterated by this mechanism of nature, for what useful purpose beyond considerations of sexual selections do his *markings* exist, since *they* are not obliterated? The answer is that the markings on the animal become a picture of such background as one might see if the animal were transparent. They help the animal to coalesce, in appearance, with the background which is visible when the observer looks past him. In many birds, for instance, those colors, which would be seen by an enemy looking down upon them, are laid on by nature in coarser and more blotchy patterns than are the colors on their sides, so that when you look down on them you see that their backs match the mottled ground about them; whereas, when you assume a lower point of view nearer their level, and see more and more of their sides, you find them painted to match the more intricate designs of the vegetation which is a little farther off, and which, from this new stand-point of the observer, now forms the background. In this latter position, the head of the animal, being the highest part of its body, is seen against the most distant part of the background, whose details are still more reduced by perspective. To correspond with this reduction of strength in the more distant background, the details on the sides of the animal's head are likewise reduced in their emphasis, and like the more distant details are smaller in pattern.

It is a most significant fact that throughout the animal kingdom the highest development of the arrangement of color and light described in this article, and the highest development of the habit of standing or crouching motionless in full daylight to avoid discovery, seem to coincide very closely. For instance, Gallinaeous birds, most Waders, and the Cat tribe have both the color arrangement and the standing or the crouching habit highly developed. Contrasted with these, for example, are the skunks



FIG. 1. SIDE VIEW OF DEAD GROUSE TO SHOW COLOR GRADATION.



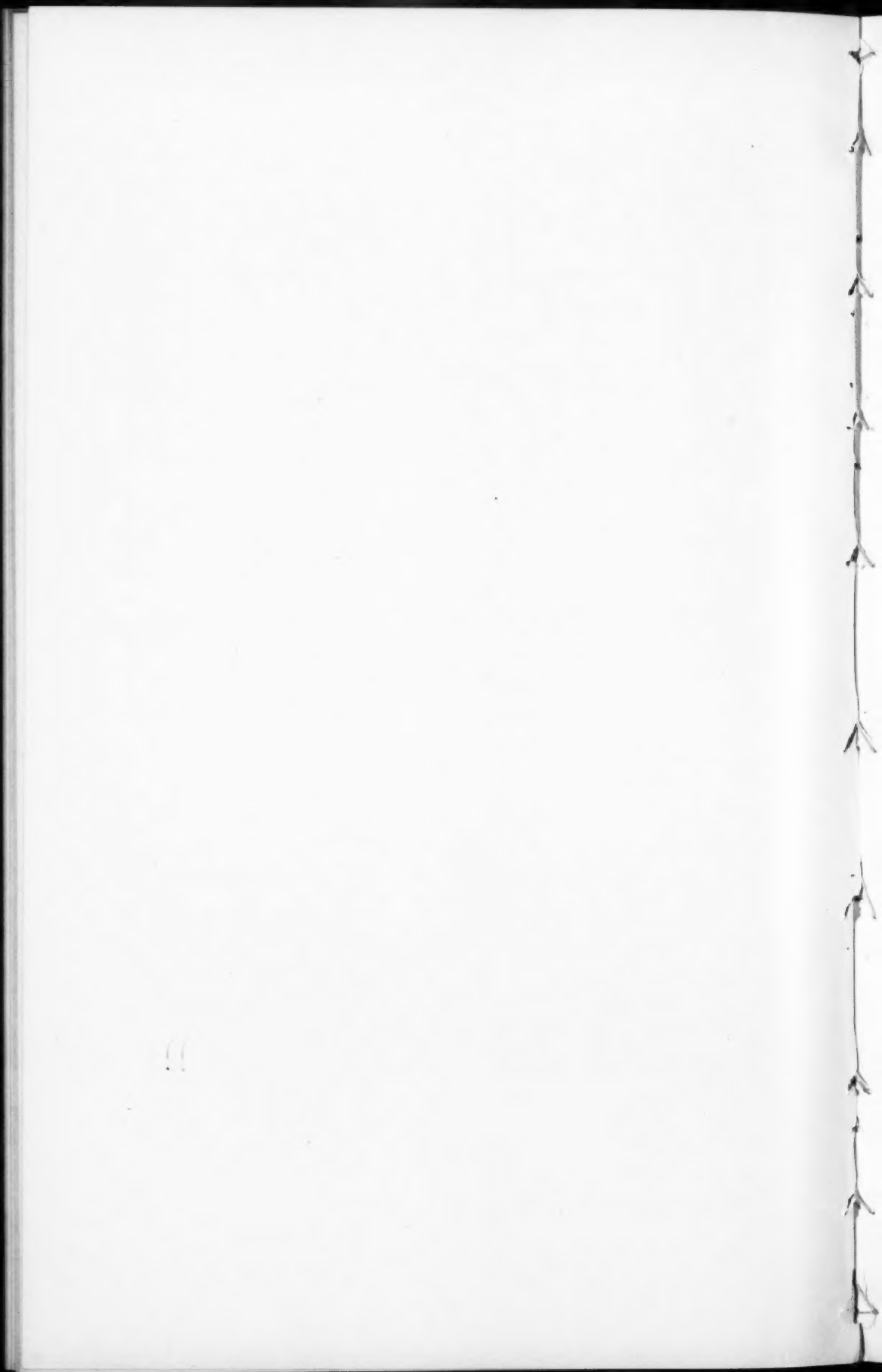
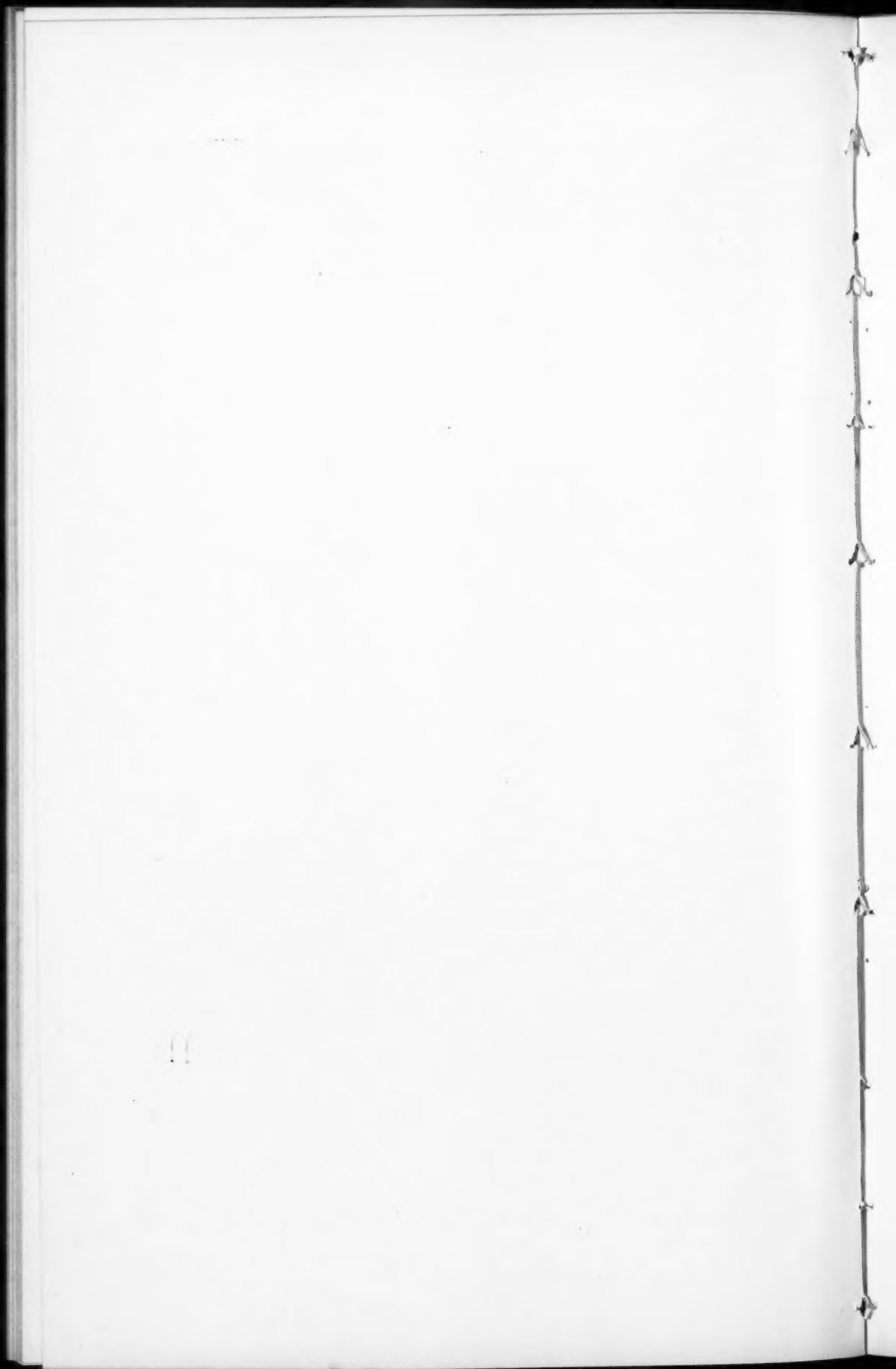






FIG. 2. GROUSE POSED ON THE GROUND AS IN LIFE.



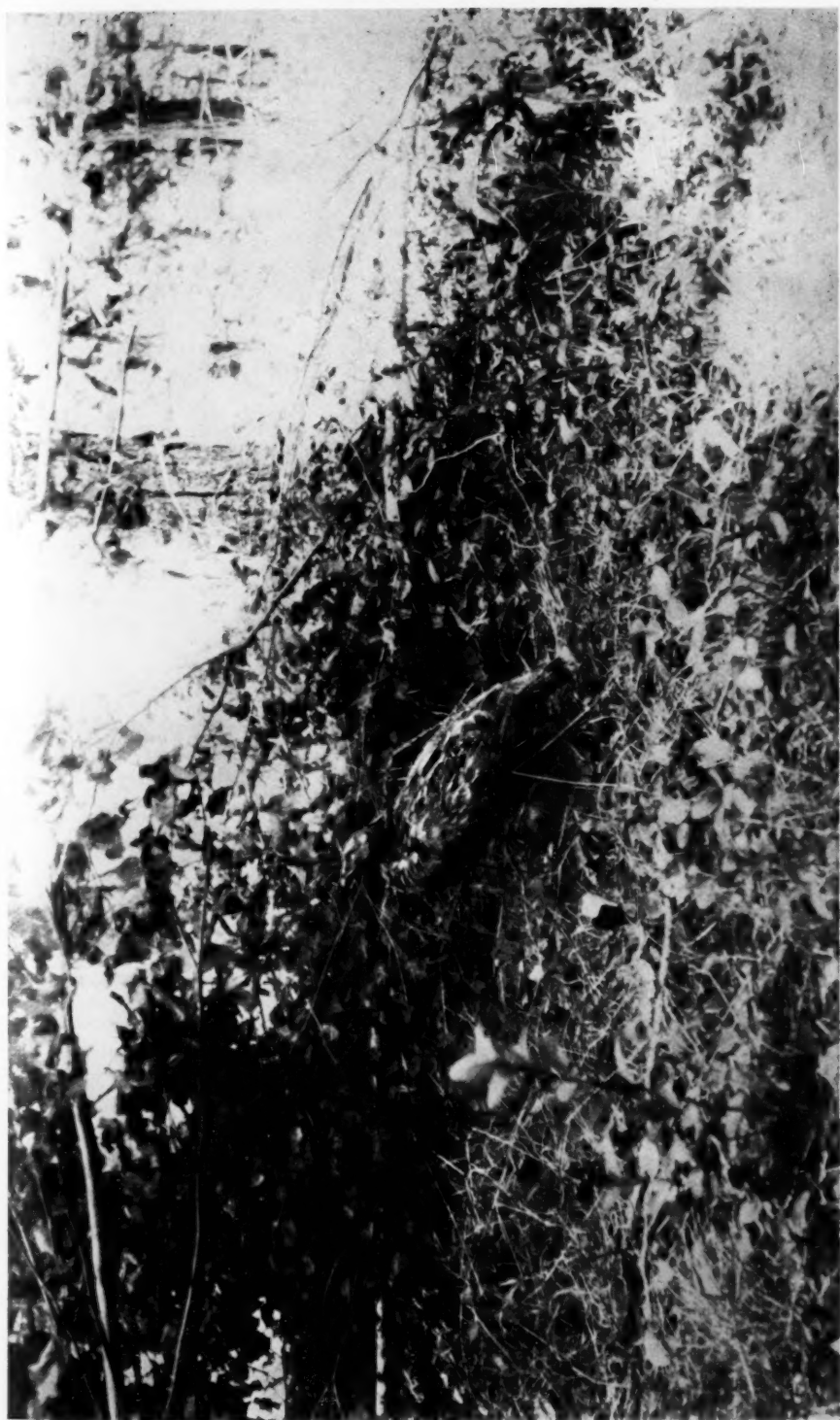


FIG. 3. GROUSE POSED AS IN FIG. 2 BUT WITH COLOR GRADATION PAINTED OUT.





FIG. 4. GROUSE ON SIDE, EXPOSING BREAST.



FIG. 5. GROUSE ON SIDE, EXPOSING BACK.



FIG. 6. WOODCOCK ON SIDE, EXPOSING BACK.



FIG. 7. WOODCOCK ON SIDE, EXPOSING BREAST.

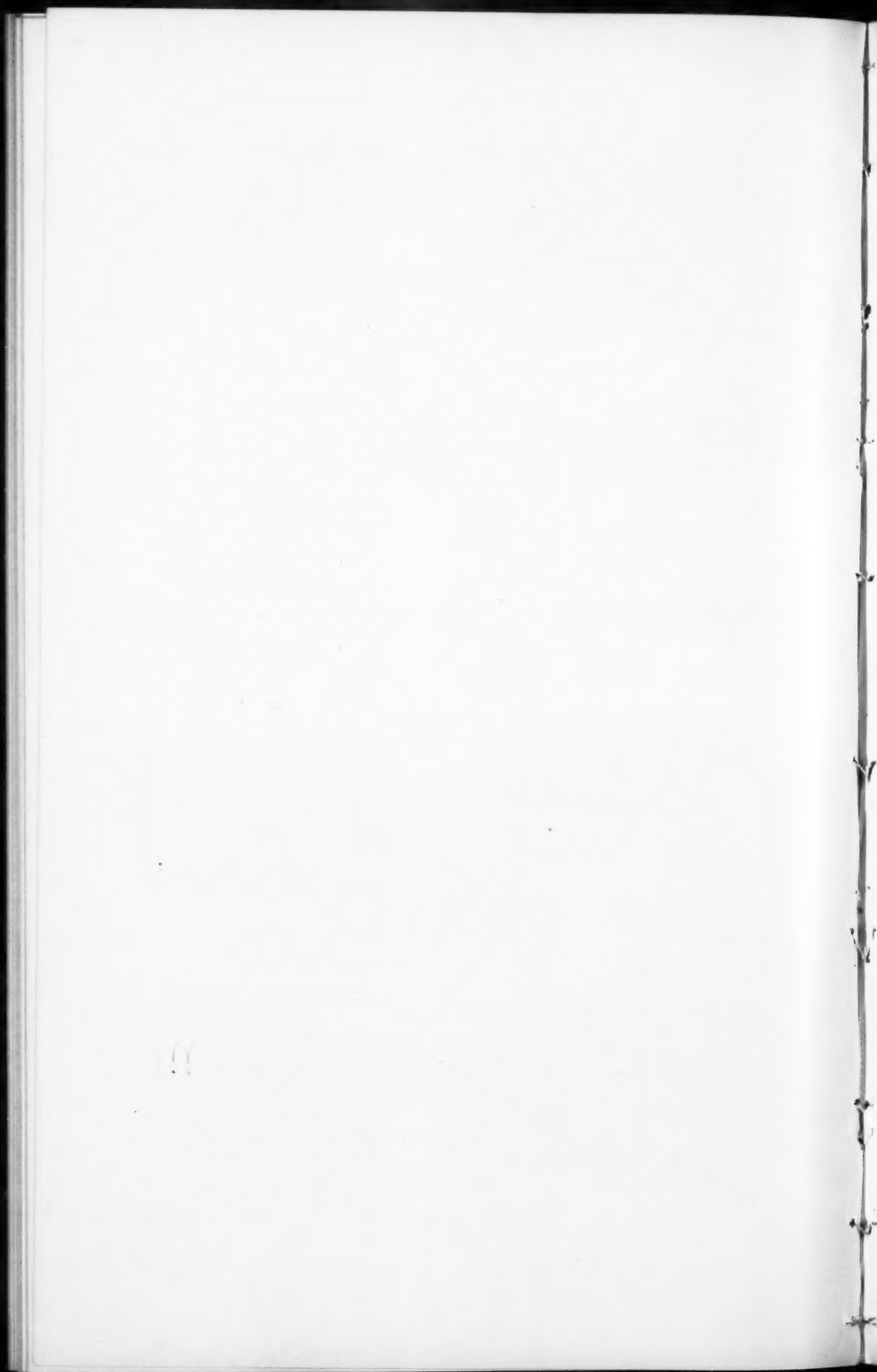


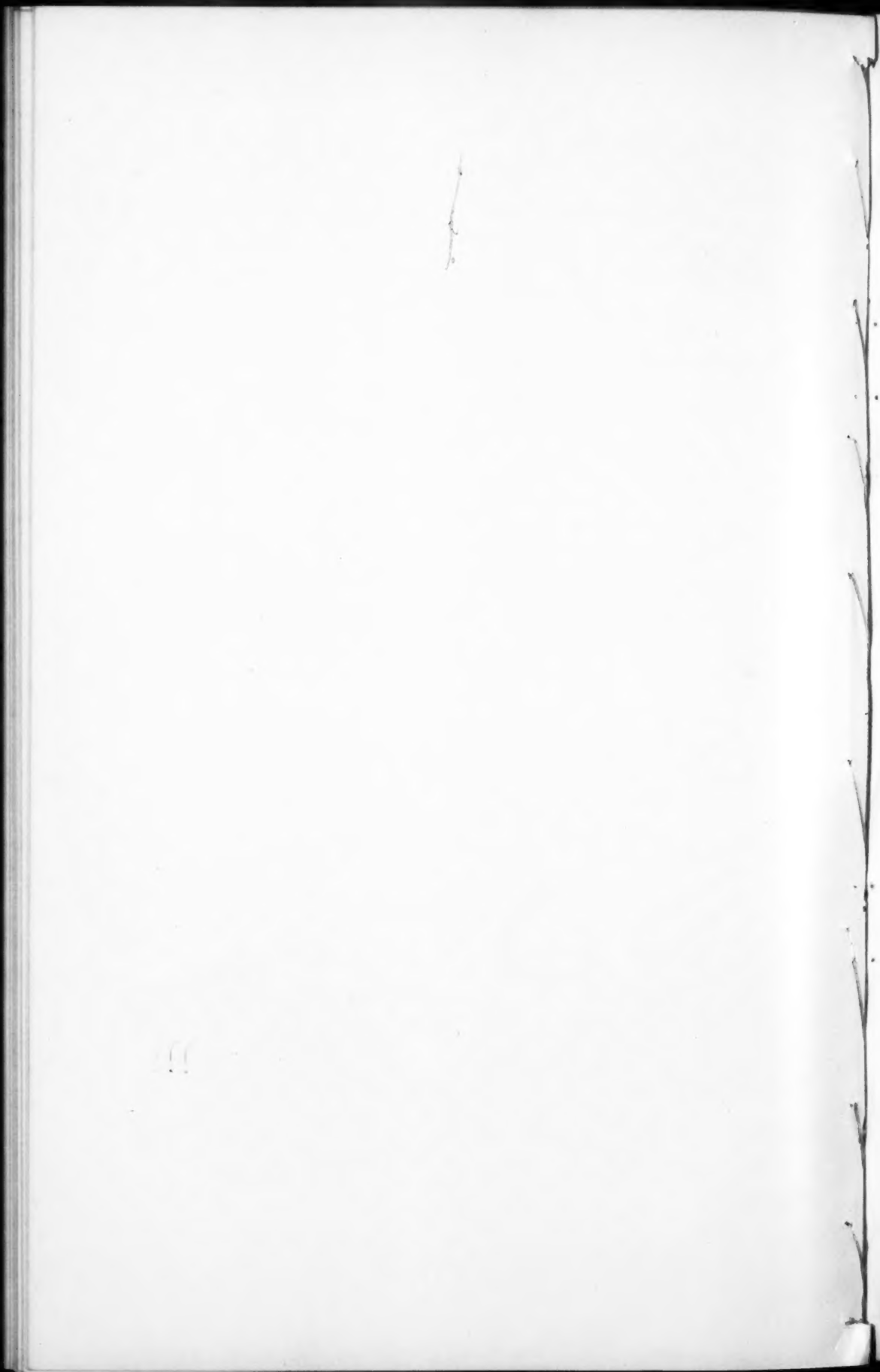




FIG. 8. WOODCOCK ON NEST



FIG. 9. WOODCOCK ON NEST, COLOR GRADATION PAINTED OUT.



and the bears. Neither of these quadrupeds has the gradation of color, nor the standing or crouching habit. They are both nocturnal, and therefore do not need either gradation or crouching for concealment.

It is plain, then, that while nature undeniably completes the concealment of animals by pitching their whole color-gradation in a key to match their environment, the real magic lies in the gradation itself from darkest above to lightest below, wherever this gradation is found. This is why it is so hard to see the Partridge in the tree, the Sandpiper on the mud, or the tiger crouching in the jungle.

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#### DESCRIPTIONS OF A NEW HORNED LARK AND A NEW SONG SPARROW, WITH REMARKS ON SENNETT'S NIGHTHAWK.

BY LOUIS B. BISHOP.

THE birds upon which this paper is based were collected by Mr. W. H. Hoyt and myself in Towner and Rolette Counties, North Dakota, during the spring and summer of 1895. Both counties belong to the prairie region, are practically treeless, cultivated only partially, and dotted with lakes and sloughs of varying extent. The Turtle Mountains, part of which lie in the northern part of Rolette County, and through which passes the Manitoba boundary, are utterly different in character. They consist of hills rising a few hundred feet above the rolling prairie, contain numberless small lakes and ponds, and are covered with a dense growth of deciduous trees.

My thanks are due to Mr. Hoyt for the use of his series of skins of the races described, and to Dr. Allen and Mr. Chapman of the American Museum of Natural History, and to Mr. Ridgway of the Smithsonian Institution, for the privilege of comparing my birds with the collections of the respective museums.

**Otocoris alpestris hoyti**, new subspecies. HOYT'S HORNED LARK.

*Subspecific characters.*—Similar to *Otocoris alpestris* but with the upper parts generally paler and more gray, the posterior auriculars gray rather than brown, and the yellow of the head and neck replaced by white, excepting the forehead, which is dirty yellowish-white, and the throat, which is distinctly yellow, most pronounced toward the center.

*Type*, ♂ ad. (No. 1447, collection of L. B. Bishop), Cando, Towner County, North Dakota, April 22, 1895; L. B. B.

Length, 7.35; wing, 4.54; tail, 3.01; bill from nostril, .41; tarsus, .89.

The adult female in spring plumage (No. 1529, collection of L. B. Bishop, Rock Lake, Towner County, North Dakota, May 1, 1895) differs in a similar manner from the female of *alpestris*, but in the female of *hoyti* the yellow on the throat is much paler than in the male.

Two forms of Horned Larks are common in Towner County, North Dakota, in April: a small, pale variety most nearly allied to *O. a. arenicola*, which is already breeding, and a larger, darker bird found in flocks with the Snowflakes and Lapland Longspurs, whose reproductive organs are only slightly enlarged. This latter bird disappears early in May, and is apparently heretofore undescribed. From *leucolema* it may be separated by the darker upper parts and yellow throat, characters constant in all the specimens I have seen. The black of the malar region is broader than in skins of *alpestris*, but this difference may not always obtain. In size and color this form is intermediate between *alpestris* and *leucolema*, or rather between *alpestris*, which bounds its probable breeding-range on the east, *praticola* on the southeast, *arenicola* on the southwest, and *leucolema* on the west (*cf.* Dr. Dwight, Auk, VII, p. 144, line 14 et seq.). It can be distinguished from *arenicola* by its larger size and darker upper parts, and from *praticola* chiefly by its size, although in the latter the black markings of the jugulum and malar region are generally if not always more widely separated.

Ten adult males in breeding plumage from Towner County agree very closely with the type, differing only slightly in the intensity of the yellow on the throat, the purity of the white on the forehead, and the extent and prominence of the dark markings on the posterior part of the breast. One bird shows an

TABLE OF MEASUREMENTS OF *Otocoris alpestris hoyti*.

No. of Specimens.	Sex.	Locality.	Season.	Wing.			Tail.			Tarsus.			Bill from Nostril.		
				Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.
10	♂	North Dakota.	Spring.	4.35	4.54	4.22	2.98	3.08	2.93	.90	.92	.88	.40	.42	.37
2	♂	Depot Island.	Spring.	4.37	4.38	4.36	3.01	3.04	2.98	.90	.91	.89	.405	.41	.40
4	♂?	North Dakota.	Winter.	4.32	4.47	4.22	2.89	3.05	2.79	.89	.92	.86	.395	.38	.35
4	♀	North Dakota.	Spring.	4.06	4.13	4.01	2.70	2.85	2.62	.88	.89	.86	.38	.39	.37

approach to *alpestris* in a yellow tinge to the supraorbital line and auriculars. The dark centers of the scapulars and interscapulars are also slightly more conspicuous in some specimens than in others.

Two adult male Horned Larks in worn breeding plumage in my collection, said to have been taken by George Comer, at Depot Island, Hudson Strait, in May 1894, differ from the type of *hoyti* chiefly in having the yellow of the throat a trifle paler, and the posterior auriculars browner and slightly yellowish. They are much nearer this form than to *alpestris*, and probably mark its eastern limit.

Four Horned Larks (probably males) taken at Cando, February 13, 1891, for which I am indebted to Mr. E. T. Judd, differ from spring birds in the following particulars: the yellow of the throat is paler,—in one specimen hardly perceptible,—the gray tips of the feathers longer, quite concealing the white and black of the forehead, and partially the black crescent on the chest, and the scapulars and interscapulars browner with more conspicuous dark centers. These birds might possibly be referred to *leucolema*, as has been done with similar specimens by Dr. Dwight (Auk, Vol. VII, p. 143), but I am inclined to consider them representatives of the winter plumage of *hoyti*, principally on account of their dark upper parts, and somewhat smaller size.

I am very glad to have the opportunity of naming this race in honor of my friend Mr. William H. Hoyt of Stamford, Connecticut.

**Melospiza fasciata juddi**, new subspecies. DAKOTA SONG SPARROW.

*Subspecific characters.*—Similar to *Melospiza fasciata* but with the ground color of the upper parts paler, especially the superciliary streak and sides of neck, and the white of the lower parts clearer; the interscapulars with the black center broader, the reddish-brown portions narrower, and the gray edgings paler; the dark markings on the breast restricted, and more sharply defined against the ground color.

*Type*, ♂ ad. (No. 1674, collection of L. B. Bishop), Rock Lake, Towner County, North Dakota, May 11, 1895; L. B. B.

Length, 6.75; wing, 2.62; tail, 2.78; tarsus, .81; culmen, .51; bill from nostril, .36; depth of bill, .31.



A small series of Song Sparrows taken in Towner and Rolette Counties, North Dakota, during the spring and summer of 1895, may be separated from the eastern bird by the above characters. In general measurements, and in size and shape of the bill, this form is indistinguishable from *M. fasciata*, and shows no approach to *M. f. montana* in these respects, or in coloring. In general appearance it is characterized by a marked contrast between the light and dark portions of the plumage, most conspicuous in the interscapular region, while in *fasciata* the colors are more softly blended. From *samuelis* and *heermanni*—perhaps its nearest allies after *fasciata*—it can easily be distinguished by a much paler ground color and less intense dark markings. Song Sparrows in the collection of the American Museum of Natural History, taken near Fort Snelling, Minnesota, during the spring, are intermediate between the Dakota bird and that inhabiting the Atlantic coast, but more closely resemble the latter.

In habits the Dakota Song Sparrow resembles the eastern bird, living in the brush which grows along the banks of the 'coulées.' It arrives in Towner County the latter part of April, but is by no means common on the prairie. One or two pairs nested at Rock Lake on a small island, which was covered with a tangled growth of willows, hawthorns and rose-bushes. We found it, however, quite common during June and July in the Turtle Mountains, inhabiting both the brush of the clearings and the reed-grown margins of retired lakes. The song is quite different from that of *fasciata*, being clearer, sweeter and more powerful. The first one I heard singing I could not believe was a Song Sparrow until I had the bird in my hand.

Two nests were found in the Turtle Mountains: the first on June 14, containing three young, one egg, and one egg of the Cowbird. This nest was composed of grass, and completely concealed in some high, dry and matted grass, on the borders of a small and secluded lake. The other nest was taken by Mr. Hoyt on July 11, and, thanks to his kindness, three of the four eggs which it contained are now in my collection. This nest was similar to the other, and hidden in the high grass of a hay slough.

The eggs, which average .75 in. in length by .60 in. in breadth, show a tendency to a sub-pyriform outline—a shape certainly

unusual in *fasciata*: otherwise, with their greenish-white ground color and profuse markings of reddish-brown, they are indistinguishable from eggs of the latter.

I take pleasure in naming this form in honor of Mr. Elmer T. Judd of Cando, North Dakota, to whom the success of our trip was largely due.

Average measurements (with extremes) of ten specimens (6 ♂, 4 ♀): length, 6.54 (5.75-6.75); wing, 2.66 (2.49-2.81); tail, 2.78 (2.69-2.91); tarsus, .81 (.77-.87); culmen, .51 (.49-.55); bill from nostril, .35 (.32-.37); depth of bill, .30 (.28-.31).

#### ***Chordeiles virginianus sennetti.* SENNETT'S NIGHTHAWK.**

A series of ten adult male Nighthawks from Towner and Rolette Counties, N. D., serve at least as an argument in favor of the validity of this subspecies. All closely resemble the type specimen (No. 4927, collection of George B. Sennett), now in the American Museum of Natural History, and differ from each other only slightly in the amount of buff or ochraceous, which replaces the white irregularly in different portions of the plumage. In all buff replaces the white to some extent, but no one of this series could be mistaken for *henryi*. The general pallor of the plumage is the chief characteristic of these birds, and serves to distinguish them from *virginianus* at a glance.

Three females from the same locality taken in June and July — one of them a breeding bird taken with a typical male and two eggs — are similar but with the upper parts darker and the entire lower parts tinged with buff, which becomes ochraceous-buff on the throat. Two other female Nighthawks from the same region, one taken on June 11, and the other with two eggs on June 24, are quite different, the prevailing tint of the entire plumage, except the greater wing-coverts, wings and tail, being ochraceous-buff. These birds might readily be referred to *henryi*, but all the males taken or seen during the breeding season were unmistakably *sennetti*. Two males of *virginianus* were taken by Mr. Hoyt during the migration in the latter part of May, but none were seen during the breeding season.

Two downy young taken by Mr. John Schaler from the same nest at Rock Lake, on July 17, have an interrupted black bar across the breast, black at the base of the mandible, and the entire upper parts mottled with black, but while the ground color of one is pure white, that of the other is pale ochraceous-buff, becoming white only in the center of the abdomen. This difference may be one of sex, or, taken in connection with the ochraceous females mentioned, connect *sennetti* with *henryi*.

Wherever we went about the prairies we found this bird a rather common summer resident, especially in the neighborhood of water. It arrives the last week in May, and begins laying about the twentieth of June. The pale colors of the male protect him admirably, harmonizing with the dull gray of the fences and rocks, perched on which he passes the day, while the darker colors of the female render her less conspicuous when seated over her eggs on the black soil. Six eggs in my collection from Towner County average 1.67 in. in length by .88 in. in breadth, and are perhaps a trifle paler with somewhat smaller markings than eggs of *virginianus*.

Average measurement (with extremes) of thirteen specimens (10 ♂, 3 ♀): length, 9.53 (9.25-9.81); wing, 7.61 (7.08-7.87); tail, 4.68 (4.53-4.79).

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## AN APPARENTLY NEW *CHORDEILES* FROM COSTA RICA.

BY GEO. K. CHERRIE.

It is with much hesitation that I present the following as characterizing a new Nighthawk of the *C. virginianus* group,—that is, the species or subspecies in which the white wing-patch is posterior to the tips of the secondaries.

***Chordeiles virginianus aserriensis*,<sup>1</sup> subsp. nov.**

*Type*, No. 4261, collection Geo. K. Cherrie, San José, Costa Rica, Nov. 2, 1893. Smaller and much lighter colored (both above and below) than the true *virginianus*. Above, grayish predominating; decidedly dusky in center of back where feathers are mostly blackish basally, tipped and edged with grayish and crossed by irregular broken subterminal bands of the same color. Scapulars blackish basally, the edges with grayish mottlings and buffy blotches. Wing-coverts grayish, finely mottled with dusky. Below, upper breast grayish irregularly barred with narrow blackish bands. Lower breast, sides and flanks lightly buffy whitish regularly barred with blackish, the white and black bands being of about equal width. Center of abdomen immaculate white; under tail-coverts slightly buffy, the longer ones showing imperfect blackish bands.

Length (skin), 8.40; wing, 6.96; tail, 4.40.

This bird agrees with *C. v. chapmani* in size and in the white unmarked abdomen,<sup>2</sup> but differs greatly in color above, as it does from a large series of *virginianus* and from examples of *virginianus henryi* with which it has been compared.

The type is a male bird, but the tail does not show the broad white band near the tip found in the males of other species of *Chordeiles*, but has exactly the same tail as the females.

Whether this be constant or not, or whether in the male possessing a tail marked like that of the female it is a character of immaturity, I am not in a position to state with certainty. One of the specimens received for examination from the National Museum<sup>3</sup> (No. 128,373, U. S. N. M., Escondido River, Nic., Oct. 28, 1892, Chas. W. Richmond) apparently pertains to this new race. It is a male and has the tail markings similar to those of the type. However, in this example the terminal white band on the third pair of rectrices, from the outside, is wider than on the other feathers. In this specimen the general color above is considerably darker than in the type, approaching much nearer to *C. virginianus* proper.

<sup>1</sup> From the valley of the River Aserri, San José, C. R.

<sup>2</sup> Comparison is made with the type of *chapmani*, recently acquired by the Field Museum as a donation from Prof. C. B. Cory.

<sup>3</sup> I am indebted to the authorities of the Smithsonian Institution and to those of the American Museum of Natural History for the loan of specimens used in the preparation of this paper.

GÄTKE'S 'HELIGOLAND.'<sup>1</sup>

BY J. A. ALLEN.

HERR GÄTKE'S 'Heligoland' is beyond question a remarkable book. Its author and the island from which it takes its name are both unique in the annals of ornithological literature. It is not therefore surprising that the work has been received with almost unexampled interest by bird lovers and bird students the world over. 'Heligoland' was originally published in German in 1892, and has now received the compliment of being made accessible to English readers.

Heligoland is a small island at the mouth of the Elbe in the North Sea, about fifteen miles distant from the mainland. It is triangular in outline, slightly over a mile in length, but much less than a square mile in area. Being treeless and almost destitute of shrubbery, it affords slight chance of concealment for the birds which visit it, often in enormous numbers. But its bird population is mainly transient, only one species of land bird, the ever-present House Sparrow, being a regular breeder in any numbers. The island is thus a resting place merely — 'Die Vogelwarte Helgoland,' to borrow the expressive German title of Herr Gätke's book — for migrants, that make it a temporary place of refuge in their long journeys, in most cases tarrying for only a few hours. It also lies at the intersection of two prominent lines of migration, the one a north and south route, the other an east and west route. Here Herr Gätke for fifty years, aided by fowlers, taxidermists, and bird catchers of all sorts, has kept an incessant watch upon the ever-fluctuating bird population of this "bare and rugged isle," with the result of chronicling as visitants to Heligoland not less than 398 species, including a large number of waifs and strays from distant and in some instances most unexpected quarters of the globe. As a result, as already said, Heligoland and Herr Gätke have long been famous in the annals of orni-

<sup>1</sup> Heligoland as an Ornithological Observatory, the Result of Fifty Years' Experience. By Heinrich Gätke. Translated by Rudolph Rosenstock. Edinburgh: David Douglas. 1895. 8vo, pp. xii, 599.

thology. Hence it is natural that his book of over 600 pages, giving a detailed record of his observations and experiences, and of his views on bird migration, its causes and methods, should be hailed with delight by a wide circle of ornithological readers. As Herr Gätke has been awarded honorary membership in all of the leading ornithological societies of the world, it is perhaps not strange that his utterances on the 'mysterious' problems of bird life should be accepted as little short of oracular, and his statements taken at nearly their face value, without special scrutiny or criticism, by a large majority of his readers.

Indeed, 'Heligoland' has been pronounced by an ornithologist of high standing to be "one of the most original, most remarkable, and most valuable books ever written about birds." That it is original and remarkable no one will deny; as to its value there is easily room for difference of opinion. Herr Gätke's observations, it may be well to remember, have been limited to an almost barren island of less than a square mile in extent, with conditions necessarily exceptional, but of such a character as to give highly favorable opportunities for the study of certain features of the migratory movements of birds. But the fact that the conditions are unusual, and the field extremely limited, renders it questionable whether or not the conclusions of a single observer based thereon should outweigh the sum of all other observations made elsewhere, and the inferences and hypotheses of hundreds of excellent observers who have investigated the subject in other lands. Yet if we take Herr Gätke at his own estimate, observations made outside of Heligoland are to be discredited as in some way faulty or erroneous, if they fail to agree with those of the Oracle of Heligoland. At least, as one of his admirers puts it, "the most conspicuous result of his insistence upon the facts in the case is rank iconoclasm. He smashes our idols right and left; he leaves us at the mercy of our fables, helpless for lack of gods to supplicate, for he sets up none of his own in their places" (Auk, XII, p. 343). In other words, on most points he takes issue with what may be termed the general consensus of opinion of ornithologists, affirming that they are wrong while he must be right, or else declaring that all previous opinions and hypotheses are not only without foundation, but the point at issue is a riddle



beyond the power of man to solve. Hence we are led to a rather close scrutiny of evidence and arguments so universally iconoclastic.

'Heligoland' is indeed a remarkable book, and an important contribution, from many points of view, to the literature of ornithology; but it contains much that is set forth as fact which on close examination proves to be mere conjecture. On many points which Herr Gütke treats with great positiveness his knowledge is obviously as limited as the little field which has been the scene of his life-long labors.

Herr Gütke's book consists of three parts, entitled respectively 'Migration of Birds' (pp. 3-148), 'Changes in the Color of the Plumage of Birds without Moulting' (pp. 149-164), and 'Account of the Birds observed in Heligoland' (pp. 165-588). Part I is divided into eleven chapters or sections, relating to as many phases of the general subject of bird migration. The first chapter treats of the 'Course of Migration generally in Heligoland,' and gives a history of bird movements at the island chronologically by months from January to December. In style of treatment it is not unlike accounts that have been given of many other localities by various local observers, being a sort of calendar of the bird year at Heligoland. Its special interest is therefore due to the peculiar nature and geographic position of the island in relation to the migration routes of birds, and the long period of observation on which the account is based.

Chapter II (pp. 24-45) treats of the 'Direction of Flight.' Here his observations and conclusions are quite at variance with those of most observers at other points. He scouts the idea of 'Zugstrassen,' or restricted lines of migration, or concentrated migration by favorite routes, and affirms that "the migratory movement is performed by a broad front," which corresponds to the breadth of the breeding area. He says, for example: "The view, much discussed in recent years, that migrants follow the direction of ocean coasts, the drainage area of rivers, or depressions of valleys as fixed routes of migration, can hardly be maintained. Too many facts are directly at variance with this assumption" (p. 24). In proof of his view he cites the east and west migration of many species which, breeding in northeastern

Asia, pass Heligoland, and later turn southward to reach their winter quarters in southwestern Europe, crossing in their westward autumnal journey, nearly at right angles, all the principal mountain chains and rivers of northern Asia and Europe. River valleys being "generally endowed with a very varied vegetation and a rich insect life" are consequently "welcomed by the majority of migrants as most desirable feeding-places," and they are hence used as halting stations for "rest, food, or water,"—which fact, Gätke claims, has given rise to the idea, in the minds of superficial observers, that the migrants here met with are following the courses of the streams.

Herr Gätke recognizes at Heligoland two distinct lines of autumnal migration,—one from east to west, and another, of equal importance, from north to south (p. 37). The spring migration, in the case of the east to west migrants, differs markedly from the autumnal movement, in that the spring journey is much more rapid and made along the shortest line between the winter quarters and the breeding stations, whereas in the fall migration it describes two sides of a triangle,—namely, from eastern Asia to the coast of central Europe and thence abruptly south to northern Africa. It is further affirmed that "birds perform the journey from their winter quarters to the breeding stations, if possible, in one uninterrupted flight." That such is not the case in North America is amply proven, were there no other evidence, by the data given in Cooke and Merriam's 'Bird Migration in the Mississippi Valley,' where the daily progress of some sixty species has been traced from the Gulf of Mexico to Canada and has been found to be only from about fifteen to thirty miles per day, according to the species, and whether the species is an early or a late migrant. This seems much better evidence than the avowed basis of Herr Gätke's assumption, namely, "observations made here [at Heligoland] incidentally during the capture of birds at night at the lighthouse" (p. 44).

Chapter III (pp. 46–62) is devoted to 'Altitude of the Migration Flight.' On this point, in speaking of "migration proper," or "those large, extensive movements" which on the one hand conduct our migrants from their breeding homes to or very near their winter quarters in one uninterrupted flight, "and on the other

hand, in spring, convey them in the opposite direction from their winter quarters to their breeding haunts,— the uninterrupted continuity of the flight being still more marked in this latter phase of the migratory phenomenon,"— he says: "Observations extending over many years have led me to the conclusion that, as long as migration proceeds under normal conditions, this elevation is, in the case of by far the larger number, so great as to be completely beyond the powers of human observation; while we must regard as disturbances and irregularities of the migration movement proper, due to meteorological influences, such portions of it as are brought within our notice" (p. 46). Apparently he would place the height of the migration flight as high as 15,000 to 30,000 feet, and brings forward evidence to show that some birds attain at will a height of even 35,000 to 40,000 feet. He might have brought much stronger evidence to support his conclusion than any he cites had he been more familiar with the literature of the subject, for the observations made repeatedly in this country with telescopes directed toward the disk of the full moon during migration nights, demonstrating the fact that birds reach an altitude of from one to three miles in their migratory flights, is not mentioned.<sup>1</sup> In this connection he dwells upon the fact that birds must be very differently constituted from man or any other warm-blooded creature to be able to sustain life in such rarefied air-strata and under the low temperature of such elevations. He also comments at length on the ability possessed by many birds to vary apparently the specific gravity of their bodies, as in the case of various diving birds, and as must also be the case with birds that rise to great altitudes in flight.

The main purpose of the high altitude of the migration flight, he believes, is that these high strata of the air offer, for the time being, the most favorable conditions for migration, and render the migrating hosts independent of the numerous meteorological disturbances that affect the lower regions of the atmosphere, but that also the rarefied air of the upper regions presents less resistance to their progress.

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<sup>1</sup> See Scott and Allen, Bull. Nutt. Orn. Club, VI, 1881, pp. 97-100, 188; Chapman, Auk, V, 1888, pp. 37-39.

In Chapter IV (pp. 63-73) the 'Velocity of the Migration Flight' is considered. On this subject there is unfortunately very little positive information; hence the field is a tempting one for conjecture and inference, and Herr Gätke has not neglected to make use of it. The actual data bearing on the subject which he is able to cite does not by any means favor the high rate of speed he assigns to migrating birds; namely, 180 to 240 geographical miles per hour, not for a single hour but for many hours consecutively! The character of his proof of this proposition is fairly shown by the following. His crucial test, and the main basis of his assumption, is the spring migration of the Red-spotted Bluethroat (*Cyanecula suecica*), a bird which winters in Egypt and the neighboring countries and breeds mainly north of the 60th parallel in northern Europe. On the negative evidence that it has not been recorded as occurring anywhere in numbers in spring between the Nile Valley and Heligoland, it is assumed as beyond question that the majority of the individuals of this species, "under normal conditions, and in the absence of meteorological influences of a disturbing nature, accomplish their migration in one uninterrupted nocturnal flight, . . . thus accomplishing a distance of at least 1600 geographical miles within the space of nine hours" (pp. 65, 266), hence maintaining an average rate of speed of 180 miles an hour. The Bluethroat is cited as positive proof that other birds having the same winter quarters and breeding range must also migrate in the same way (p. 67). But he goes even further than this, citing as "the most striking and incontestable proof" of his assumption the American Golden Plover (*Charadrius dominicus*), which, he affirms, migrates in autumn from Labrador to northern Brazil in a single uninterrupted flight, over a distance of 3000 geographical miles. He says, "we may probably assume fifteen hours as the longest spell during which a bird is able to remain on the wing without taking sustenance of any kind"; and the velocity of flight of these birds would, on this assumption, "amount to 212 geographical miles per hour" (p. 69). Even this astonishing rapidity of flight he believes is not to be regarded as "either exceptional or isolated," and that the same birds "may be able to accomplish even greater feats during the spring migration." Indeed, recurring again to the Bluethroat, he believes that those

individuals which pass on from Africa to the Scandinavian peninsula, including the majority of the representatives of the species, "accomplish during the same May night a distance of 2000 to 2400 geographical miles. This would," he adds, "of course, give as a result a velocity of four miles a minute," or 240 miles an hour!

Whatever the Bluethroat may really do, the kind of migration ascribed to it is not that well known to characterize the majority of birds during the spring migration; indeed, Herr Gätke finds it necessary to explain away the observations of others, or to disregard such of their testimony as may be known to him, as of no special importance when weighed in the scale with his own "fifty years' experience" on the little island of Heligoland. Thus he says: "It has been supposed that birds are in the habit of breaking their migration journey without any very powerful disturbing cause both in autumn and spring, at the former season on reaching latitudes not so far south as those of their normal winter quarters, and in spring before they have arrived at their breeding stations. *With this assumption, however, my own experiences on this island, accumulated for many years, are at variance.*" This quotation, especially the portion here italicized, shows the attitude and spirit in which Gätke approaches the many general questions he discusses,—his own little island of a few acres in extent, nearly woodless and barren, and his own experiences limited thereto, being placed in opposition to the accumulated experience of thousands of observers scattered over the greater part of the earth.

It is quite possible that many birds, the Plovers among them, attain not unfrequently a speed of 100 to 150 miles per hour, and are able to maintain that rate for a number of consecutive hours, but that birds as a rule fly at this rate, or make the journey between their winter stations and breeding grounds "in one uninterrupted flight" is not by any means the rule, if indeed it be the case in any instance. To marshal the well-known proof of this would be almost to insult the intelligence of the experienced ornithologist. Let it suffice to say that where trustworthy observations have been made regarding the ordinary flight of Ducks, Pigeons, Hawks, and some other species, the rate of speed has been rarely found to exceed 35 to 60 miles per hour.

Again, in regard to the American Golden Plover, which he believes makes the journey from Labrador to northern Brazil "in one uninterrupted flight," it may be worth while to mention that this species is a well-known autumn migrant all along the Atlantic coast of the United States, and in the West Indies, during a period of from four to six weeks, varying in abundance, and in the length of stay of any particular flock, according to the weather, being common at numerous well-known points for from a few hours to a few days, in the case of heavy easterly storms, and rare during continued fair weather.<sup>1</sup> Because there is a record of flocks passing the Bermudas without stopping, it does not follow that these flocks may not afterwards have stopped at some of the many islands of the West Indies, or that flocks that pass the Massachusetts coast without stopping may not halt at points on the coast further south; for, as said above, the species is of frequent occurrence as an autumnal visitor all along the Atlantic coast from New England to Florida and in the West Indies.

Chapter V (pp. 74-99) considers the 'Meteorological Conditions which influence Migration,' as the force and direction of the winds, the state of the atmosphere as regards moisture, cloudiness, temperature, etc., all of these influences being intelligently discussed, and their effects illustrated by reference to the author's experiences at Heligoland.

In Chapter VI (pp. 100-113), on the 'Order of Migration according to Age and Sex,' the author's dogmatism and disregard of whatever occurs outside of Heligoland stands prominently forth. "The question," says Gütke, "as to the order of age and sex in which migrants take up their annual journeys is one on which, up to the most recent time, there have prevailed more serious errors than on any problem connected with the migration phenomenon. It was generally supposed that the old birds acted as the leaders, teachers, and guides of the young ones on their migrations; and although this view was not based on any observations whatsoever in Nature, it seemed so natural and reasonable that it was accepted in pure good faith, without subjecting it to

<sup>1</sup> See Mackay, Auk, VIII, 1891, pp. 17-24 — record of the autumn migration of this species in Massachusetts for thirty years. *Ibid.*, IX, 1892, p. 199; X, 1893, p. 79; XI, 1894, p. 75; XII, 1895, p. 78; XIII, 1896, pp. 89-92, *passim*.



the test of observation and experiment [p. 100]. . . . But this representation . . . is really nothing more than a plausibly sounding fable, in which — quite after the manner of a fable — the old and wise individuals represent the teachers and guides of simple youth. In reality, however, this explanation of the question not only lacks all support of actual facts, *but is entirely at variance with every observation hitherto made in Nature*" (p. 102). While there is perhaps a taint of the fabulous in the case as here put, if taken too literally — namely, that the young are led and guided by the old and experienced — it is difficult to understand the arrogance and dogmatism of the portion of the above extract here printed in italics, since numberless observers of the widest experience and utmost trustworthiness take the opposite view from Herr Gätke on this matter. While Gätke's experience may exceed that of most other observers as regards length of time, it is confined to a minute locality and to exceptional conditions, whereas the published evidence he so loftily declares not to exist is based on the experiences of observers whose field of research includes vast areas and more normal conditions.

Speaking of Heligoland, he thus summarizes the "incontestable result of all the numerous phenomena" there observed as follows: "1. That under normal conditions in the case of the 396 species occurring here, with the exception of a single one [the Cuckoo], the autumn migration is initiated by the young birds, from about six to eight weeks after leaving their nests. 2. That the parents of these young individuals do not follow till one or two months later. 3. That of these old birds again, the most handsome old males are the last to set out on the migratory journey. In spring this order is inverted" (p. 102).

This explicit statement that in the case of these 396 species (with the one exception noted), "the autumn migration is initiated by the young birds, from about six to eight weeks after leaving their nests," seems at first sight to carry great weight, and we naturally turn to Part III of the book to learn what these species are and their status as Heligoland birds. An examination of the list soon reveals the fact that over 200 of the 396 species must be classed as merely stragglers to Heligoland,<sup>1</sup> more than one half of

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<sup>1</sup> See Coues, 'The Auk,' Vol. XII, 1895, pp. 322-346.

which have been detected in Heligoland only once each, in a period of fifty years, and half of the remainder but twice each! Furthermore that in many instances these records are spring records, the species having never been taken in Heligoland in autumn. A further examination of the list shows that not more than one-third of these 396 species are really in evidence as regards the autumnal migration. Notwithstanding this misleading statement as to the extent of the evidence, we cannot suppose that Gätke is mistaken in regard to the order of appearance of the old and young birds at Heligoland after the breeding season in the case of such familiar species as the Starling, the Wheatear, the Pied Flycatcher, the Whinchat, the Redstart, Willow Warbler, the Ortolan Bunting, etc., the young of which are reported as appearing in Heligoland from the last of June or early part of July onward till September, weeks in advance of the old birds. As these birds all breed commonly on the adjoining mainland, it is doubtful whether these early visits of young birds indicate anything more than local movements of young birds prior to the season of true migration. As only one land bird, the ubiquitous House Sparrow, breeds regularly in numbers on this little unfortified island, any visitors from the neighboring mainland after the breeding season appear to be entered in Mr. Gätke's list of fall migrants. Indeed it is evident that these young birds, only a few weeks from the nest, must be many of them still in nestling plumage, and hence unfitted to start on their regular autumnal migration.

The case, however, is different with the young Golden Plovers (*Charadrius plumialis*) recorded as arriving at Heligoland the first week in July, since the breeding grounds are more distant. It goes to show, however, that allied (congeneric) species of birds may behave very differently at different places, for it is a well established fact that on the eastern coast of North America the adult birds arrive first in the case of the American Golden Plover.<sup>1</sup> Also it is almost the uniform testimony of our best American observers that as a rule, among song birds as well as

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<sup>1</sup> See especially Mackay, Auk, XIII, 1896, pp. 90-92; also Feilden, Ibis, 1889, p. 491.

shore birds, the adults precede the young in the autumnal migration.

In Chapter VII (pp. 114-130), under the head of 'Exceptional Migration Phenomena,' are grouped many facts of interest respecting the season and character of occurrence and sources of origin of the numerous waifs and strays, or chance visitors, which have been taken or observed on Heligoland.

Chapter VIII (pp. 131-142) is devoted to a consideration of the question 'What Guides Birds during their Migrations?' and Chapter IX (pp. 143-148) to 'The Cause of the Migratory Movement.' These are principally made up of destructive criticism of the theories and suggestions of previous writers, his conclusion being that the former question "presents to the savants of our day as great a riddle as it did to the first observer in ages before the dawn of history" (p. 132). He concludes Chapter VIII by saying: "Having thus examined the many various attempts made to explain the wonderful faculty possessed by migrants of discovering the right path of their migration, and shown how insufficient most of them are when confronted with actual facts, observed directly in nature, in the course of more than fifty years' investigations and at a spot so favoured as Heligoland, I cannot say that I feel encouraged to add further to the number of such attempts by others of my own" (p. 142). As he has during the previous chapters advanced theories of his own to explain the various phenomena of migration, usually in direct opposition to those of other students of the subject, and has not hesitated to reject as not worth considering observations made elsewhere if they do not tally with his "fifty years' investigations" on his "favoured little isle of Heligoland," it seems almost remarkable that he should content himself in the present case — after proving (to his own satisfaction) everybody else wrong — with this modest confession of inability to explain this old-time riddle. He discards the idea of definite routes of migration; of topographic features of the landscape, — coast lines, river courses, and mountain chains, — serving as landmarks; and discredits the possibility of a hereditary transmission of knowledge derived from experience. He erroneously assumes that because birds migrate principally by

night it is impossible for them to distinguish the nature of the country beneath them, and that hence if they were possessed of a highly developed local sense of direction it would be of no service to them on such journeys.

In regard to the "immediate cause of the departure of birds on their migrations," he believes "we are confronted with a riddle which has hitherto defied every attempt at a solution, and which indeed we may hardly expect will ever be likely to receive a final explanation. . . . In thus abstaining from setting forth new theories, I have been guided by the conviction, rendered firmer with increasing knowledge of the phenomena, that what at present has been ascertained in reference to the migration of birds furnishes us with no clue, by the aid of which we are enabled to penetrate the depths of this wondrous mystery" (p. 148).

In reality, great light has unquestionably been thrown upon the causes of migration, the manner of its performance, the conditions which influence it, and the factors that aid in guiding birds on their migrations, by the systematic observations so extensively carried on in Europe and in America, during especially the last ten or twelve years. Yet the love of mystery is so inherent in the popular mind, and the habit of viewing the migration of birds as the "mystery of mysteries" in bird life is so firmly fixed, that it is perhaps not strange that a reasonable explanation of all the principal phenomena of the subject should be received as unwelcome iconoclasm on the part of one who clings tenaciously to life-long modes of thought. The "several very ingenious and plausible hypotheses," resulting from "long and profound study," find no favor with Herr Gätke, though favorably received by the newer school of migration observers, who consider the subject as no longer invested in "impenetrable mystery."

In Part II (pp. 151-164) he takes up the subject of 'Changes in the Colour of the Plumage of Birds without Moulting,' in the discussion of which the author displays a depth of ignorance and a misapprehension of simple facts that ill comports with his claim of "having for many years devoted the most unremitting attention" to the subject. He evidently knows little about the way birds

moult, or he would not, as on page 110, consider it "singular how such a bird [as the Hooded Crow] could lose so many of the flight feathers of *both* wings" at the same time, or fail to recognize a spring moult in so many of the species he cites as changing to the breeding dress without any renewal of the plumage.

He says: "The change from the winter plumage to the breeding dress *without moulting* is accomplished in three different ways. The simplest of these consists in the shedding of the edges of the feathers of the winter plumage." This he correctly describes, citing numerous species in which it is exemplified,—a change well known to intelligent ornithologists the world over. The second method, he says, "consists, so far as I have been able to determine without the help of a microscope, in a peeling off of the separate barbs of the feathers, whereby these are stripped of a thin inconspicuously coloured envelope, so that the purer and finer colour previously concealed beneath the latter becomes exposed" (p. 152). In reality this is in part a less marked wearing off of the edges of the feathers mentioned under his first method of change, and in part a slight alteration of colour due to the exposure of the plumage to the influence of the elements. The "peeling" process is an original discovery of Herr Gütke, and doubtless exists largely, if not solely, in his fertile imagination.

"The last and most wonderful process in the colour changes of the plumage of birds, not attended by a renewal of the feathers themselves, consists in an actual, complete, and very striking change in the colour of the feathers, without such alteration being brought about, or even assisted, by any change in their texture. As illustrating the climax of this process," he continues, "we may probably point to the change from pure snow-white to an intense glossy black or blackish brown" (p. 153), as he avers occurs in the head and neck of the Little Gull and in the fore-neck and upper breast of the White and Pied Wagtails, and in the heads and necks of Guillemots and Auks. The manner of this change he describes with a minuteness that seems to bar all cavil at its correctness, were it not for the utter improbability of the case, and the known fact that in the same or allied American species this spring change from white to black is due to moult and a complete renewal of the plumage of the parts involved!

His remarks on the changes of colour in various species of

Limicolæ, and especially in the Sanderling and Golden Plover, is equally absurd and erroneous, although the changes are described with a minuteness of detail that would seem to imply a careful examination of specimens. In fact, he seems to have made such examinations, as he says his observations are based "on fresh examples, in which, by examination of the inner cutaneous surface, it was possible to determine with certainty whether moulting actually took place or not. . . . Where the change of colour proceeds by gradational stages in this manner, the bird under examination completely gives one the impression of being fully in the moulting state, and, in fact, examples of this kind have been sent me by ornithologists of repute in proof of a moulting process. A close and exact examination, however, at once reveals the fact that all these scattered and newly coloured feathers are of perfectly normal size; nor do we find among them any others of half or more than half their full growth, still within the dermal quill [sheath], as would be the case if one were dealing with a moulting individual" (p. 163). On this point it must be said that Gätke was very unfortunate in selecting his material, or very careless in his observations; as ordinarily it is by no means difficult to find in such specimens as he describes plenty of feathers in all stages of growth. How he could have failed to discover them is hard to conceive. His interpretation of the markings and changes he so minutely describes must be due to so strong a preconceived notion of what ought to occur that he was blinded to the real facts in the case. Indeed, according to Gätke, in speaking of the Sanderling, not only does the color of the feathers change but "at the same time the serrated indentations [due to wear] of the worn posterior flight feathers, the abraded tips of the barbs which formed the light lateral markings" are restored. "When this [transformation] is complete, the feathers are of a dusky black colour, the large triangular spots at their margins nearly white, the serrated indentations of the edges of the feathers are filled out, and the whole plumage has the appearance as if it had just been renewed by moulting,"—which, in fact, is just what has happened! <sup>1</sup>

<sup>1</sup> In this connection see 'The Changes of Plumage in the Dunlin and Sanderling,' by Frank M. Chapman (Bull. Am. Mus. Nat. Hist., VIII, 1896, pp. 1-8), written with special reference to Gätke's remarkable statements.



If his statements are true, not only does an old, long-worn feather receive an influx of pigment, but has its worn and ragged edges restored by the addition of new growths to the edges,—“a restoration of the worn and blunted barbs to their previous entirety.” In other words, we must suppose that a feather after months of wear is capable of rejuvenation to the extent of not only developing a system of circulation for the transmission of pigment through the shaft and out into the ultimate divisions of the barbs, but also solid matter for the restoration of the structural parts of the feather which have been worn away by abrasion! Thus, in speaking of the Spotted Redshank, the Marsh and Wood Sandpipers, he says the light triangular spots on the margins of the flight feathers and larger feathers of the upper parts “are so little able to stand wear, that by the end of the winter they have almost or entirely disappeared, as a result of which the remaining portions of the feathers have acquired jagged edges something like the cutting edge of a saw. It is this edge which, in the course of the colour changes, is restored” (p. 157).

That such statements can be made seriously by any intelligent ornithologist, and still more be quoted with approval by prominent authorities on bird matters (see *Auk*, XII, p. 346, and *Ibis*, Jan., 1896, p. 142), is almost beyond belief. In short, it would be hard to find a greater amount of error in an equal space than is crowded into Herr Gätke's fifteen pages on ‘Change in Colour of the Plumage of Birds without Moulting,’ or more astonishingly absurd statements.<sup>1</sup>

If this is the result of “the most unremitting attention for many years” to this subject at Heligoland, which “supplies us with an abundance of material for observation,” we may perhaps reasonably feel a little distrust of some of Herr Gätke's observations and conclusions based on “fifty years of investigation” at

<sup>1</sup> It may be added here that this chapter was published in substance by Herr Gätke in 1854, in the ‘*Journal für Ornithologie*,’ pp. 321–327, in an article entitled ‘*Einige Beobachtungen über Farbenwechsel durch Umfärbung ohne Mauser*.’

For further comment on this paper of Gätke's, and on others of similar character by other authors, see *Bull. Am. Mus. Nat. Hist.*, VIII, 1896, pp. 13–44.

this favored island on the general subject of migration, when, as is so often the case, they run counter to the observations of ornithologists at large, with more favorable opportunities for getting at the general facts of migration as displayed over wide areas. It is not an agreeable task to pick flaws in a work received in many quarters almost as oracular,—a work, moreover, so pleasantly written, and apparently with such sincerity of purpose, and containing so much of real value; yet to let such errors pass unchallenged is not the way to promote truth, or to advance the science of ornithology.

Part III (pp. 167-588) gives an 'Account of the Birds observed in Heligoland.' These number 396 (+ 1 added at p. x = total 397),—an extraordinarily large number for a locality of such limited area. A careful synopsis of the list (see Coues, Auk, XII, 1895, pp. 324-342), however, shows that fully one-half are stragglers. Thus, during fifty years, 97 species have been taken or observed only once each; 33 species, only twice each; and 70 species, three times or more. About 130 species are regular migrants either in spring or fall or during both seasons, while about 50 are more or less regular winter residents. Some 16 species have been known to breed, but some of them in only one or two instances, the others, except one, more or less irregularly.

Among the stragglers, the occurrence of fifteen exclusively North American species is recorded, which Herr Gätke shows (p. 124) most probably in nearly every instance reached Heligoland by a journey across the North Atlantic. Other stragglers are casual visitors from the far North; many others, from the far East, and others still from the South, are species which have far overstepped their usual boundaries.

In commenting on the large number of 'casual visitants' that have been taken on the little island of Heligoland, Herr Gätke considers that their appearance in such numbers on so small an area is proof that an incomparably larger number must annually pass across Europe. If, he says "twenty, fifty, or even a hundred examples of Richard's Pipit occur here in one day [of course an exceptional occurrence], these numbers can only represent a minute fraction of the quite incomputable quantity of these birds

which are travelling at the same period from Dauria to Western Europe."

Gätke's list is copiously and interestingly annotated, the annotations often occupying several pages, the records being in most instances very fully and satisfactorily given. The nomenclature, however, is antiquated, being for the most part that of Naumann, and hence dating almost from Gätke's boyhood. In the English translation the equivalent modern names are given in footnotes, when different from those used in the text, as is usually the case. In a few instances the identifications may be open to question, especially in some of the few cases where the species was only observed and not actually taken.

With all its imperfections 'Heligoland' is a book of great interest and value, Part III being a particularly useful contribution to the literature of ornithology. It is also a work that is likely to do much harm, for it is its sensational and inaccurate parts especially that find their way into the current literature of the day, and particularly into magazines and books devoted to the popularization of natural history.

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## A REVISION OF THE NORTH AMERICAN HORNED OWLS WITH DESCRIPTION OF A NEW SUBSPECIES.

BY WITMER STONE.

IT is not a pleasant task to overthrow a scientific name long in use, but under certain circumstances it seems unavoidable, and the case of *Bubo virginianus subarcticus* (Hoy) is an instance of this kind.

Some years ago while engaged in cataloguing the Owls in the collection of the Academy of Natural Sciences of Philadelphia I found the type specimen of "*Bubo subarcticus* Hoy." The bird was mounted, and on the under side of the stand were written the

following data in the hand of John Cassin: "*Bubo subarcticus* Hoy, Racine, Wisconsin. Original specimen described by Dr. Hoy and presented by him 1853. J. C." The description is in the 'Proceedings' of the Academy for 1852, p. 211, and evidently refers to the specimen in question.

This specimen at once struck me as being much lighter in color than any examples of *subarcticus* that I had examined; in fact it seemed nearer to the description of *arcticus* as given in the books. Not having any specimens of undoubted *arcticus* for comparison, and the figure of this form in 'Fauna Boreali-Americana' being still lighter than the specimen in hand, I let the matter stand until I had an opportunity to make direct comparison.

Recently I showed the specimen to Mr. Leverett M. Loomis, who agreed with me that it must be very close to *arcticus*. A few days later, while together in Washington, we examined specimens of *arcticus* in the National Museum Collection and concluded that the type of *subarcticus* was identical with them.

To make matters sure, however, I sent the type specimen to Mr. Robert Ridgway, on my return to Philadelphia, and after making a careful comparison, he writes me: "The bird is unquestionably referable to *arcticus* Swainson, agreeing closely with specimens in our collection from Winnipeg. It is darker than the specimen described and figured in the 'Fauna Boreali-Americana,' which seems to have been an exceptionally light-colored example."

As a result of this investigation the name "*Bubo subarcticus* Hoy" will have to become a synonym of *Bubo virginianus arcticus* (Swainson), leaving the form from the Great Plains and southwestern United States, which was formerly known as *Bubo virginianus subarcticus* (Hoy), to be renamed. So far as I can ascertain, the only other name that has been proposed for the western Horned Owl is *pacificus* Cassin, 'Illustrations of the Birds of California, Texas,' etc., p. 178.

Cassin here recognizes three varieties of *Bubo virginianus*,—(1) *atlanticus*, the eastern bird, (2) *pacificus*, the western, and (3) *arcticus* Swains., the northern form. He very properly suggests that *subarcticus* Hoy is a synonym of *arcticus* Swains., which suggestion has been ignored by subsequent writers. The names *atlanticus* and *pacificus* were here proposed for the first time. The

former is of course a synonym pure and simple of *B. virginianus* (Gmel.), while under *pacificus* he apparently intended to include all western Horned Owls known to him and not coming under *arcticus* Swains. The diagnosis of *pacificus*, however, clearly applies to the light-colored owls. Mr. Ridgway apparently noticed this fact, and although he had at first used *pacificus* Cass. for the dark owl of the Northwest and Rocky Mountain region, he afterwards proposed the name *saturatus* for this form.

According to the laws of nomenclature *pacificus* Cass. cannot be ignored, and while its application to the light-colored western Horned Owls seems sufficiently clear, the separation of the dark western bird as *saturatus* Ridgw. emphasizes it still more.

Just here, however, there is another point to consider, *i. e.*, whether there are not two well marked races of these light-colored birds included under the old "*subarcticus*."

I have for some years past noticed that the Horned Owls from southern California differed from the light-colored examples from farther east in their uniformly smaller size and the increased mottling on the feathers of the tarsus. These differences I think are sufficiently well marked to warrant the separation of the two forms.

The name *pacificus* Cass. (Dwarf Horned Owl) I would restrict to the small southern California subspecies, as Cassin calls particular attention to the general small size of examples of this variety, and furthermore had California specimens in the series that he studied. For the large form from the Great Plains I would propose the name

#### ***Bubo virginianus occidentalis.* WESTERN HORNED OWL.**

The several races would then be distinguished as follows, using in part the phraseology of Ridgway's 'Manual.'

*a'*. Color darker, with dusky markings more extensive or more numerous. Plumage much mixed with tawny or ochraceous.

*b'*. Moderately dark, face mostly rusty and plumage with an excess of tawny rufous. . . . *Bubo virginianus* (Gmel.).

*b''*. Extremely dark, face usually sooty brown mixed with whitish, plumage with less tawny, sometimes none.

*B. virginianus saturatus* Ridgw.

*a''*. Color lighter, gray and buff tints predominating over the darker markings; lower parts whiter.

*b'*. General aspect above grayish with more or less buffy admixture; dark markings below distinct.

*c'*. Size small, w. 13 in., tarsi, strongly mottled.

*B. virginianus pacificus* Cass.

*c''*. Size large, w. 16 in., tarsi with mottling much less distinct.

*B. virginianus occidentalis* subsp. nov.

*b''*. General aspect above white, ground color faded, beneath pure white with dark markings restricted.

*B. virginianus arcticus* (Swains.).

A specimen of *B. virginianus pacificus* Cass. before me (No. 27905, coll. Acad. Nat. Sci. Phila., San Bernardino, Cal., April, 1887, ♂, coll. by R. B. Herron) measures: wing, 12.95; culmen, 1.48; tarsus (to insertion of hind toe), 1.80; middle claw to sheath, .95.

The type of *B. virginianus occidentalis* (No. 26435, coll. Acad. Nat. Sci. Phila., Mitchell Co., Iowa, winter, 1880, coll. W. L. Abbott), probably a female, measures: wing, 16; culmen, 1.80; tarsus (to insertion of hind toe), 2.50; middle claw to sheath, 1.25.

The markings of *pacificus*, especially beneath, seem to average darker than in *occidentalis*, in such specimens as I have seen. The exact range of the two I cannot ascertain without examining a larger series.

## RECENT LITERATURE.

The 'Birds' of 'The Royal Natural History.'<sup>1</sup>—The last half of Volume III of 'The Royal Natural History' is devoted to Birds, Volumes

<sup>1</sup> The Royal | Natural History | Edited by | Richard Lydekker, B. A., F. R. S., Etc. | With Preface by | P. L. Sclater, M. A., Ph.D., F. R. S., Etc. | Secretary of the Zoölogical Society of London | Illustrated with | Seventy-two Coloured Plates and Sixteen Hundred Engravings | by W. Kuhnert, F. Specht, P. J. Smit, G. Mützel, A. T. Elwes, J. Wolf, | Gambier Bolton, F. Z. S., and many others | Vol. III. | London | Frederick Warne & Co. | and New York | 1894-95 | [All Rights Reserved.] Super Royal 8vo. Birds, Vol. III, pp. 289-576, Vol. IV, pp. 1-192 (*et seq.*).



I and II and the first half of Volume III being given to Mammals. The work is issued in fortnightly parts, consisting of about 100 pages of text, two colored plates, and numerous text figures. The birds begin with No. 16 (No. 4 of Vol. III), of which Nos. 16 (Dec. 15, 1895) to 20 (Feb. 15, 1896) are now before us for notice. The bird matter thus far includes pp. 289-576 of Vol. III. and pp. 1-192 of Vol. IV, and beginning with the Passeres, extends to about half way through the Diurnal Birds of Prey, and is divided into twelve chapters. Chapters II to VI (Vol. III, pp. 305-544), which include the order Passeres, are by H. A. Macpherson, with some assistance from the editor, Mr. Lydekker, in Chapter II (see footnote to p. 374). Chapters VII to IX (Vol. III, pp. 545-576, and Vol. IV, pp. 1-90), embracing 'The Picarians,' are by R. Bowdler Sharpe. The authorship of Chapter I, 'General Characteristics,—Class Aves' (Vol. III, pp. 289-304), Chapter X, 'The Parrot Tribe,—Order Psittaci' (Vol. IV, pp. 91-139), Chapter XI, 'The Owls and Ospreys,—Orders Striges and Pandiones' (Vol. IV, pp. 140-173), and Chapter XII, 'The Diurnal Birds of Prey, or Accipitrines,—Order Accipitres' (Vol. IV, pp. 174-192, et. seq.) is thus far not indicated. As is easily noticeable, the style of treatment varies in the different parts of the work, as regards symmetry, accuracy, and familiarity of the author with his subject.

The work is to be considered of course from the standpoint of a general popular treatise on the class Aves, with the limitations as to space necessarily entailed by such an undertaking. Hence a minimum of technicalities is to be expected, with perhaps a very unequal allotment of space in proportion to the numerical size of the groups treated. Yet, considering the high scientific standing of the editor, we have reason to expect at least accuracy, if not fullness and uniformity of treatment of the groups that must be marshalled in review. Judged by these standards the work, as a whole, well stands the test, and in general merits the generous patronage of the public. Many of the groups are admirably treated and indicate the work of a practiced hand, as especially the varied assortment of family groups here arrayed under the general term of 'The Picarians.' The same is true, in large measure, for the Parrots and the Birds of Prey.

The great group of Passeres presents greater difficulties, owing to their diversity and numerical abundance, in comparison to the other orders of the class, so that the question of what groups to mention and what to pass unnoticed with so limited a space for their treatment, is obviously one of great embarrassment, and the selection would here severely tax the skill of the expert. Yet it is easy to perceive that the author often finds himself in unaccustomed fields.

The introductory chapter is quite too brief for the satisfactory treatment of the generalities of the subject, but is fortunately supplemented to a considerable extent by the introductory paragraphs to the orders in the body of the work. Yet we think the general reader would have been profited by a few additional paragraphs on feathers,—giving something

for instance about their development, pigmentation, their coloration, and especially their structure in its relation to color. In regard to their nature and development we have only the absolutely erroneous statement (Vol. III, p. 290) that feathers correspond "in *essential structure* to hairs," and that they are "similarly developed," etc., which is also untrue. There is also looseness of statement (p. 299) regarding the barbules and hooklets, due perhaps to excessive effort at condensation of treatment, while the case is a little overdrawn (p. 291) in the statement that "it is impossible to kill a winged bird by compressing its windpipe." We regret also to see the Gätkean ideas introduced under the head of 'Migration' (p. 302), to the effect that "the configuration of continents and oceans" must be invisible to migrating birds, even in the daytime, owing to the great height at which they travel.

The classification followed is essentially that propounded some fifteen years ago by Dr. Sclater, on the ground that, owing to the present diversity of views on the subject, it is probably as good as any for a popular work like the present,—a statement we have no desire to controvert. In regard to the Passeres, the arrangement of Dr. Sharpe is adopted, which places the Corvidæ at the head,—an arrangement which at present seems to meet with wide approval.

It is of course easy to find fault with a popular work of this general character, however good it may be or however conscientiously prepared. Yet we may perhaps be pardoned for pointing to a few errors of statement or omission that would hardly be anticipated in the present connection. Thus (p. 309) the reference to *Xanthura* fails to indicate that this brilliant genus of tropical American Jays is remarkable for its yellow and green colors rather than for its blue and black markings. In speaking of the Siberian Jay (*Perisoreus infaustus*) as "a characteristic bird of the most northern parts of the Old World," it seems strange no reference is made to the fact that the genus *Perisoreus* is even more characteristic (as regards number of species) of the northern parts of North America. Again from the account of the Crossbills, one might infer that all were so closely related as to be probably referable to one species, no reference being made to the group with white wing-bars. In referring to the distribution of the Pipits (p. 432), the omission to note the occurrence of a considerable number of species in South America, taken with the reference to North America, leads to the inference that they are absent from that continent.

In speaking of the Baltimore Oriole (p. 357) there is either a bad jumble of the text of the two paragraphs headed respectively 'Cassiques' and 'The True Hangnests,' or else a most unpardonable lapse, for the Baltimore does not "build in large companies," nor have as many as forty nests on a single tree, nor breed in November, but these statements might well apply to some of the South American Cassiques. In the next paragraph we have the erroneous statement that the Bobolink "winters in Central America and the West Indies," whereas it merely passes through

these regions on its way to and from South America. That some species of Cowbirds (p. 358) "seize upon the nests of others birds, and having driven away the rightful possessors, proceed to rear their own young in their new home," must be a new discovery in the economy of these birds.

Weaver-Birds (Ploceidæ) are said to differ from Finches (Fringillidæ) in that some of the former undergo a partial spring moult; the fact being that many genera of Finches also moult in the spring. Indeed, in many families of birds, in genera closely allied, some have a spring moult and others do not.

Of the Rose-breasted Grosbeak (p. 381), its summer range, it is said, "extends to Labrador." We will not, however, dwell on the inevitable slips in a work of this nature. Among Passeres those inhabiting Europe and especially the British Islands, naturally receive the most attention, many of the more prominent species being noticed at considerable length; on the other hand, those of the two Americas receive little attention, even those of North America coming in for slight notice, and generally only when they belong to genera common also to the Old World. Thus of the great American Family Tyrannidæ, only two of the 400 species are distinctively mentioned, and only one member of the great Family Formicariidæ, the family itself, as a group, being unnoticed. Nor is there any reference to the interesting Family Pterotochidæ, although the little group of Plant-cutters (Phytotomidæ) receives nearly a page. Of the great number of Sparrows inhabiting North and South America, only one is specially mentioned (that is, exclusive of so-called 'Buntings' and Finches, allied for the most part to Old World forms); and this in such a way as to be unrecognizable to American readers, except for the technical name given in parenthesis. Thus, says Mr. Macpherson, under the heading 'Allied Genera' (p. 416): "The Sparrow-bunting (*Zonotrichia albicollis*) belonging to a group of genera in which the tail is longer than the wing," etc.—four lines in all.

When North American birds are mentioned it is hard to understand why, by both Mr. Macpherson and Dr. Sharpe, vernacular names are given to them which no American reader would recognize, nor any ornithologist, if the technical names were omitted,—names apparently coined to suit the whim of the writer, regardless of the fact that the birds already have book names almost as distinctive and as stable as the technical names of the systematists. Why our White-throated Sparrow should be given the meaningless title of 'Sparrow Bunting,' or our Grackles be dubbed 'Troupials,' or our White-throated Swift be called 'Pied Swift,' to cite a few representative cases, it is hard to conceive.

While the text of Dr. Sharpe's portion of the work is generally much more free from lapses than that relating to the Passeres, there is a curious error on p. 43 (Vol. IV) where in speaking of different species of Night Jars he says: "And a fourth, the one represented in the accompanying figure (*C. virginianus*) tells you to *whip-poor-will!* *whip-poor-will!* in tones wonderfully clear and startling." A glance at the cut, labeled 'Vir-

ginian Nightjar,' shows at once that it is the Night-hawk (*Chordeiles virginianus*) and not the Whip-poor-will, as Dr. Sharpe seems to have supposed. As figures of both species are given in the work from which the figure is taken, it is evident that the wrong figure was accidentally selected.

As already said, the work as a whole is well worthy of the patronage of the public, for if it fails to tell all there is to know about birds, it gives a vast amount of interesting and trustworthy information in a small compass. The illustrations add greatly to its value and usefulness, but they are for the most part old acquaintances that have previously seen service repeatedly in other connections.—J. A. A.

**Saunders and Salvin's Catalogue of the Gaviæ and Tubinares.**—Volume XXV of the British Museum Catalogue of Birds<sup>1</sup> contains the Gaviæ, or the Terns, Gulls, and Skuas, by Mr. Howard Saunders, and the Tubinares, or the Petrels and Albatrosses, by Mr. Osbert Salvin. The authorities of the British Museum have thus been fortunate enough to secure the two leading specialists on these difficult orders of birds for their elaboration.

The Gaviæ, or the Longipennes of the A. O. U. Check-List, of which 115 species are here recognized, are arranged in twenty genera and two families—Laridæ and Stercorariidæ, the Rynchopidæ being treated as a subfamily of Laridæ and placed between the Terns and Gulls. It is not clear why the name Gaviæ, proposed by Bonaparte in 1850 for a rather extensive and heterogeneous group, should be preferred to Longipennes, as restricted and defined by Nitzsch in 1840, or forty years before the term Gaviæ was narrowed down to its present signification. Neither is it evident why the Skimmers should be interposed between the Terns and Gulls, especially as it is admittedly a difficult matter to draw a satisfactory dividing line between the Terns and Gulls. Yet we have in the present work a subfamily Sterninæ separated from a subfamily Larinæ by a group so distinct from either of these really coalescing groups as to be often of late given the rank of a distinct family.

Passing to details of special interest to American ornithologists, we note the following: *Hydrochelidon surinamensis* is separated specifically from *H. nigra*, on the ground probably that Mr. Saunders does not recognize subspecies; forms that are regarded as entitled to recognition being

<sup>1</sup> Catalogue | of the | Gaviæ and Tubinares | in the | Collection | of the | British Museum. | — | Gaviæ | (Terns, Gulls, and Skuas) | by | Howard Saunders. | Tubinares (Petrels and Albatrosses) | by | Osbert Salvin. | London : Printed by order of the Trustees. | Sold by | Longmans & Co., 39 Paternoster Row; | B. Quaritch, 15 Piccadilly; Dulau & Co., 37 Soho Square, W.; | Kegan Paul & Co., Paternoster House, Charing Cross Road; | and at the | British Museum (Natural History), Cromwell Road, S. W. | 1896. = Catalogue of the Birds in the British Museum, Vol. XXV. 8vo, pp. i-xv, 1-475, pll. i-viii.

treated as full species. *Gelochelidon anglica* (Montague, 1813) is preferred to *nilotica* Hasselq., 1762 (this edition of Hasselquist, by the way, is not cited), apparently because the date of *nilotica* is prior to 1766, since no names appear to be countenanced that antedate the 12th (1766) edition of Linné's 'Systema Naturæ.' *Sterna fluviatilis* Naum., 1819, is preferred to *S. hirundo* Linn., 1758, and *S. macrura* Naum., 1819, to *S. paradisea* Brünnich, 1764, probably for a similar reason. Cabot's Tern is regarded as not separable from the Old World form, for which Mr. Saunders prefers the name *cantiaca* to the earlier *sandvicensis*. The American Herring Gull is also considered as not entitled to separation from the European; but Mr. Saunders's remarks on the subject are not likely to change the opinions of those who hold to a different view, since no new points are adduced, and the fact of an average and fairly constant difference between the two forms is admitted. *Larus barrovianus* Ridgw. is referred to *L. glaucus*, but the other recently described North American species of *Larus* have passed the present ordeal unscathed. The case is somewhat different with *Rissa*, of which only two species, *R. tridactyla* and *R. brevirostris*, are recognized; the slight differences in size and the relative development of the diminutive hind-toe being found inconstant for the two other forms that have sometimes been recognized as *kotzebui* and *policaris*.

Among the little group of North American Skuas the changes in nomenclature are confusing and disheartening. For reasons already given, in place of *Megalestris skua* (Brünn., 1764) we have *M. catarrhactes* (Linn., 1766); in *Stercorarius* the Long-tailed Jaeger receives the name *parasiticus* Linn., while *crepidatus* Banks is applied to the *parasiticus* of the A. O. U. Check-List. This of course is in accordance with views long held by Mr. Saunders on the subject, but against the general consensus of opinion.

Passing now to the Tubinares, Mr. Salvin divides them into four families,—Procellariidæ, Puffinidæ, Pelecanoididæ, and Diomedeidæ,—their constituents being fairly indicated by the names employed. The 109 species recognized are arranged under 25 genera. The three genera most numerous represented are *Oceanodroma*, with 12 species, *Puffinus* with 20 species, and *Estrelata* with 30 species. The following three species are described as new: *Oceanodroma tristrami* (ex Stejneger, MS., p. 354), *Pelecanoides exsul* (p. 438), *Diomedea chionopectera* (p. 443), and *Thalassogeron layardi* (p. 450).

As regards North American species, we note several important changes of nomenclature. Thus *Puffinus gravis* (O'Reilly, 1818) supercedes *P. major* (Faber, 1822); *Puffinus borealis* Cory is treated as a pure synonym of *P. kuhli*; *P. opisthomelas* Coues replaces *P. gavia*, which is considered as restricted to "New Zealand and Australian Seas"; on the other hand, *P. auduboni* is regarded as not separable from *P. obscurus*. *Puffinus stricklandi* Ridgway is referred to *Procellaria grisea* Gmelin, and hence becomes *Puffinus griseus*, the Atlantic and Pacific birds being con-

sidered as not separable. *Priocella* is raised to a full genus. *Fulmarus glacialis rogersii* and *F. g. glupischa* are given the rank of full species, while *F. g. minor* is referred as a pure synonym to *F. glacialis*.

The volume as a whole, despite the few criticisms of nomenclature in which we have indulged, easily takes its place as among the best of this admirable series, and for which ornithologists cannot be too grateful.—J. A. A.

Salvadori's Catalogue of the Chenomorphæ, Crypturi, and Ratitæ.<sup>1</sup>—

According to the arrangement adopted by Count Salvadori, the order Chenomorphæ consists of three suborders, Palamedææ, Phœnicopteri, and Anseres. The first, embracing the Screamers, consists of only two genera and three species, all South American. The second, containing the Flamingoes, includes three genera and six species, of which four species are American, one only extending northward to Florida. Hence the great bulk of the Chenomorphæ belong to the Anseres, consisting of the single family Anatidæ, here subdivided into 11 subfamilies and 64 genera. The total number of species recognized is 196. Among the Ducks, *Chaulelasmus*, *Mareca*, *Nettion* and *Querquedula* are recognized as full genera. Of the larger genera, *Anas* contains 17 species, *Nettion* 15, and *Querquedula* 5. The following new genera are recognized: *Asarcornis*, type *Anas scutulata* S. Müll. (p. 59); *Pteronetta*, type *Querquedula hartlaubii* Cassin (p. 63); *Nesochen*, type *Anser sandvicensis* Vigors (p. 126); *Elasmonetta*, type *Anas chlorotis* G. R. Gray (p. 287). Also three new species, — *Erismatura æquatorialis*, Ecuador (p. 450); *Merganetta frænata*, Chili (p. 458); *Merganser comatus*, Central Asia (p. 475).

As regards the treatment of North American species, it may be noted further that *Cygnus* is substituted for *Olor* for the Swans; *Chen hyperboreus nivalis* is given the rank of a full species; *Anser albifrons gambeli* is kept separate from *A. albifrons*, although "scarcely different"; under the genus *Branta*, *hutchinsi*, *occidentalis* and *minima* stand as full species. The same is true of *Anas maculosa* Sennett. *Nyroca* is adopted in place of *Aythya*; both date from 1822, but *Aythya* is here ruled out as a *nomen nudum*. *Fuligula* stands as a full genus; and *Aythya marila nearctica* is referred to *F. marila*, with the following remark: "According to Dr. Stejneger, the American form (*nearctica*) has the primaries, from the

<sup>1</sup> Catalogue | of the | Chenomorphæ | (Palamedææ, Phœnicopteri, Anseres), | Crypturi, | and | Ratitæ | in the | Collection | of the | British Museum. | By T. Salvadori. | London: | Printed by order of the Trustees. | Sold by | Longmans & Co., 39 Paternoster Row; | B. Quaritch, 15 Piccadilly; Dulau & Co., 37 Soho Square, W.; | Kegan Paul & Co., Paternoster House, Charing Cross Road; | and at the | British Museum (Natural History), Cromwell Road, S. W. | 1895. = Catalogue of the Birds in the British Museum, Vol. XXVII. 8vo, pp. i-xv, 1-636, pll. i-xix.



fourth quill, with a greyish — not white — area on the inner web. I must confess that I have been unable to appreciate the difference."

*Clangula* again replaces *Glaucion*, to which both *Glaucionetta* and *Charitonetta* Stejn. are referred as synonyms. The American form of the Golden-eye (*americana*) is not considered separable from true *clangula* (here called *glaucion*). Of course *Harelda* is used in place of *Clangula* for the Old-squaw; and, as specific names published earlier than 1766 are not recognized, *hiemalis* Linn., 1758, is ignored for *glacialis* Linn., 1766; so that the species stands as *Harelda glacialis*. By what rule *Histrionicus* Lesson, 1828, is set aside for *Cosmonessa* Kaup, 1829, is not evident, unless it be to avoid the terrible tautology of *Histrionicus histrionicus*! *Somateria mollissima borealis* is not separated from *S. mollissima*.

If our author is right, our Ruddy Duck must stand as *Erismatura jamaicensis* (Gmelin, 1788), instead of, as universally heretofore, *E. rubida* (Wilson, 1814).

Two species not included in the A. O. U. Check-List are attributed to North America, namely: (1) *Mergus albellus*, which, on p. 467, is said to occur "occasionally in North America," partly apparently on old records now discredited, but also positively on the basis of a specimen in the British Museum, entered (p. 468) as "v" ♀ ad. st. N. America, Hudson's Bay Co." (2) *Oidemia carbo* (Pall.), of which a specimen (p. 412) is thus doubtfully recorded from Alaska, "g. (?) Juv. sk. St. Michael's, Alaska, Oct. (E. W. Nelson). Salvin-Godman Coll." Also: " ? Northwestern America, south in winter to California," with the following remark: "There are no adult specimens from Alaska in the British Museum, so that I am unable to decide Alaskan birds really belong to *Æ. carbo*."

The Crypturi, forming Order XX of the Carinate Birds in the system of the British Museum Catalogue, constitute a single family, with 9 genera and 65 species, of which latter 14 are here described for the first time. The group ranges from Mexico to Paraguay, and the species are exceedingly difficult to discriminate.

The volume concludes with the Ratite Birds, forming four orders and five families, but numbering only about 27 species.

As noted above, many changes from current nomenclature are introduced, most of which would have been needless if the author could have permitted himself to accept the 10th instead of the 12th edition of Linné's 'Systema Naturæ' as his starting point for specific names. This is the more to be regretted, since the 10th edition is now almost universally accepted as the starting point for binomial names in zoölogical nomenclature. We also observe certain lapses from consistency in the use of names in a specific sense which have also been adopted as generic names. Thus unless *Fuligula fuligula* (p. 363) is a lapsus, it would seem proper, in accordance with good modern usage, to employ also *Cygnus cygnus* in place of *Cygnus musicus* (p. 26); *Coscoroba coscoroba* instead of *Coscoroba*

*candida* (p. 42); *Anser anser* instead of *Anser ferus* (p. 89); *Tadorna tadorna* instead of *Tadorna cornuta* (p. 171); *Casarca casarca* instead of *Casarca rutila* (p. 177); *Querquedula querquedula* instead of *Querquedula circia* (p. 293), and especially in this case where *Querquedula* is often considered as not generically separable from *Anas*; *Nyroca nyroca* instead of *Nyroca africana* (p. 345); *Clangula clangula* instead of *Clangula glaucion* (p. 376); *Merganser merganser* instead of *Merganser castor* (p. 472); *Casuarus casuarus* instead of *Casuarus galeatus* (p. 592). Through some unexplained exception to the author's evident rule, in the case of *Rhea americanus*, Linné is taken at 1758 instead of 1766, which otherwise would give us also *Rhea rhea* (p. 578). Although Brisson's genera are in some instances taken, Brisson's *Anhima* is rejected for the later *Ptilamedea* of Linné (p. 2).

Count Salvadori has expended an enormous amount of labor on this thick volume of nearly 600 pages. The bibliographical references are exceedingly full; the references to the anatomy are separated from the others, as are also the references to hybrids, which among the Ducks are so numerous as to form a striking feature of the bibliography. While the part of the work relating to the Anseres will prove so immensely valuable to the general student, the author's revision of the Crypturi will be hailed as a special godsend by those brought into relation with this exceedingly troublesome and difficult group.—J. A. A.

**Chapman on Changes of Plumage in the Dunlin and Sanderling.**<sup>1</sup>—There is no uncertain ring about the present paper. It boldly challenges certain statements of an eminent European authority, Herr Gätke, and proves them erroneous, not by any theoretical arguments advanced to nicely fit the case, but by a simple statement of facts which leave no room for doubt. An interesting chapter of Gätke's book 'Die Vogelwarte Helgoland' is devoted to the long mooted question of changes taking place in feathers without moult, and much stress is laid upon repigmentation and renewal of abraded contour as important factors in the process of passing from the winter to the summer plumage of many species. The Dunlin (*Tringa alpina*) and the Sanderling (*Calidris arenaria*) are two of the species in which the gradual change is described with great minuteness of detail. One can almost see the black color spreading over the gray feathers of the back and the worn tips blossoming, so to speak, into new feathers by a "restoration of the worn and blunted barbs to their previous entirety," but unfortunately for this theory Mr. Chapman has examined no less than fifty-seven specimens of the former species (including the subspecies *pacifica*) and ninety-seven of the latter which show conclusively that a complete moult takes place in both, except in the rectrices and remiges of the Dunlin. Twelve specimens of the Dunlin

<sup>1</sup>The Changes of Plumage in the Dunlin and Sanderling. By Frank M. Chapman. Amer. Mus. Nat. Hist., VIII, art. I., pp. 1-8 (March 4, 1896).

taken between April 2 and May 22 show various stages of the moult. "Many of these new black or rufous and black feathers are half grown, while a few are fully grown and their unworn edges are in strong contrast to the ragged borders of the gray winter plumage." In one specimen, "one cannot raise the plumage of any part of the body without discovering numbers of growing new feathers wrapped in their dermal sheaths." Twenty specimens of the Sanderling likewise show a moult in progress during March, April and May. Mr. Chapman has also seen moulting spring specimens of the Golden Plover, Knot and others of the Limicolæ, in which group Gätke states that color changes without moult frequently occur. That no moulting birds should have fallen into this ornithologist's hands is most surprising, and yet on hardly any other assumption can we understand his reaffirmation of the old idea of a color change in worn feathers with restoration by a new growth of the ragged edges. Inasmuch as this theory, resting as it does, upon a most unphysiological basis, is overset in the case of two of the species cited by Gätke in its support, what grounds have we for believing it will apply to any of the others?

He asserts almost dogmatically that a number of species acquire their summer dress without spring moult and Mr. Chapman shows us specimens of two of these very species in the midst of a moult at the time when Gätke declares they are simply growing new barbs on the old feathers and providing in them a fresh influx of new pigment. Can there be any doubt as to who is in error? If fifty years' experience with the birds of Heligoland leads to such deductions as these we may well wonder on what sort of material they are based and hope for more light upon the other species which Gätke has deprived of the normal way of changing their plumage by a moult. To Mr. Chapman we are indebted for the valuable contribution he makes to a subject which has long vexed those who have been reader with strange theories to fit obvious facts than with material to substantiate their theories. — J. D., JR.

**Chapman on the Plumage of the Snowflake.**<sup>1</sup> — The gradual change from the brown tinged winter plumage of the Snowflake into its abraded black and white summer dress is clearly demonstrated to occur without the loss of a single feather. Diagrams show at a glance that the dorsal feathers of the male during the winter gradually lose their brownish margins and by June "in place of the rounded outline of the brown-tipped feather we have left only its pointed black base. The rest of the plumage undergoes a similar alteration which in some places is evidently assisted by fading." The knowledge of this change without moult is not new, although among our early writers Wilson and Audubon do not seem to have been aware of it. Richardson and Swainson in 'Fauna Boreali-

<sup>1</sup> On the Changes of Plumage in the Snowflake (*Plectrophenax nivalis*). By Frank M. Chapman. Bull. Amer. Mus. Nat. Hist., VIII, Art. II., pp. 9-12 (March 5, 1896).

Americana,' 1831, and Nuttall in his 'Manual,' 1832, describe it, but not as if they considered it new. Mr. Chapman, however, goes further and would explain why the dorsal feathers wear only down to the black bases. He says that microscopical examination "shows that at their apical portion the barbs are separated and that the barbules do not become fairly interlocked until the black basal part is reached." The black area is therefore more protected and furthermore it is asserted that the black pigment by virtue of its density adds strength to the feather. The fact that the female never entirely wears away the brownish border and the fact that the "interlocking" of the barbules in many cases does *not* correspond with the black area, both militate against Mr. Chapman's theory and suggest other factors to explain the deciduous feather tips.

Incidentally a new and valuable point of difference between the plumages of the two sexes is brought out. "The male has the feathers of the head, nape and rump basally white, while in the female they are basally black," — this difference holding at all seasons of the year. The Snowflake is one of the interesting species that undergo but one moult in the year. — J. D., JR.

**Allen on Alleged Changes of Color in the Feathers of Birds without Moulting.**<sup>1</sup> — It is small wonder that this paper should bristle with exclamation points. It is a summary and criticism of the work of some of the more important writers upon the subject of color changes in feathers without moult, and it deals unsparingly with those who have asserted as possible the complete rejuvenation of an abraded feather. Beginning apparently with the Rev. John Flemming, there have been many writers of greater or less repute, even down to the present day, who have advanced various theories to account for color changes in plumage otherwise than by moult. The most radical of them have assumed that a recoloration of the individual feathers takes place and even a renewal, by a new growth of barbs, of the ragged edges of worn feathers. After stating that this "delusion" "forms a most instructive chapter in the general history of the origin and persistence of error," Dr. Allen proceeds to sketch this history and demonstrate the worthlessness of most of the evidence presented in its support. He maintains that, almost without exception, the hypotheses advanced are not supported by facts and that if moulting specimens of birds had not been so generally discarded in making collections, speculation upon supposed color changes would not have run riot. In brief, "the inventors of these diverse theories have assumed and attempted to explain conditions that in nine cases out of ten had no existence; namely, a color change demonstrably due — normally at least — to molt, which they have supposed must happen in some other

<sup>1</sup> Alleged Changes of Color in the Feathers of Birds without Molting. By J. A. Allen. Bull. Am. Mus. Nat. Hist., Vol. VIII, Art. III, pp. 13-44 (March 18, 1896).

way." This is the matter in a nutshell. Moulting birds have not fallen into the hands of some of the older observers and they have jumped to the conclusion that no moult had taken place. Even so, it is not easy to understand why the observations of Bachman, Homeyer, Brehm and others who have traced the various stages of moult in many species should have had so little weight against the opinions of Ord, Yarrell, Schlegel, Fatio, Gätke, and the other delusionists. But since we find the latter still supported by reputable writers of to-day, the present paper is all the more welcome, and ought to stimulate further investigations; for if it can be proved that a certain species acquires by moult the plumage that it theoretically should acquire by recoloration and rejuvenation, theory begins to totter. This is exactly what Dr. Allen does, and he cites a number of species in his support, so that the theories for the most part become respectable ruins. The fact seems to be that few observers have had sufficient material on which to build, and if the time devoted to inventing theories to fit the material had been intelligently spent in accumulating such specimens as were needed, the many fanciful and superfluous hypotheses now current would not have arisen. It is hardly profitable to dwell upon them and they may be read in the paper now under discussion. Neither is a microscope necessary to controvert them. When, for example, Severtzof by aid of this instrument describes a color bearing fluid ascending in the old feather by capillarity, exuding from the broken barbs, or depositing its pigment in successive layers on the cell walls, what do such observations mean if the feather is really renewed by a moult? Dr. Allen, by proving the delusionists wrong in part, believes them wrong in all their conclusions and gives adherence to the opinion of Bachman who, in 1839, said: "If the feathers in birds, then, which have been long stationary in their growth, are capable of receiving a new set of secretions, and of assuming opposite colors, we must seek for some new law of nature not hitherto discovered." — J. D., JR.

**The Mockingbird and *Yucca aloifolia*.**—The sixth annual report of the Missouri Botanical Garden<sup>1</sup> contains one paper of especial interest to ornithologists. It is entitled 'Studies on the Dissemination and Leaf Reflexions of *Yucca aloifolia* and other Species,' by Herbert J. Webber, and the facts it brings to light are strikingly illustrative of the close relations which economic ornithology and botany may have for each other. The fruit of this species of yucca has an edible sticky pulp, in which the seeds are imbedded without a core. Mr. Webber finds that the Mockingbird is particularly fond of this fruit and is an important agent in the dissemination of the seeds. In eating the pulp some of the seeds stick to the bill and are shaken off, falling at a suitable distance from the plant to allow of germination and growth. But in their haste and

<sup>1</sup> Missouri Botanical Garden. Sixth Annual Report. St. Louis, Mo. Published by the Board of Trustees, 1895.

greediness the birds swallow many of the seeds. Mr. Webber experimented with a captive Mockingbird and found that the seeds were readily swallowed with the fruit and were evacuated in from fifteen minutes to an hour in good condition for germination. During about four hours the bird ate and evacuated fifty-one seeds. A number of these were planted, and a fair proportion grew into healthy young plants. The Mockingbird is also responsible for a third method of dissemination. It will readily be seen that, as the bird feeds, many of the seeds drop directly down. Some of them fall into the crown of upturned leaves immediately beneath the fruit-stalk and stick there. After the cluster has ripened all its fruit, a lateral branch develops and shoots up beside the fruit-stalk, bearing a new crown of leaves and thus prolonging the trunk, while the old leaves reflex and point downwards. With the reflexion of these leaves, the seeds, now dry, roll or slide down the inclined plane thus formed and are shot out to a safe distance from the parent plant. Those seeds which originally fall between the leaves of the crown naturally reach the ground in the same way by the reflexed blades of the previous leaf-cluster. This yucca has in the larva of a moth another aid to dissemination, but that is a story for the entomologist. — F. H. A.

**Loomis on California Water Birds.**<sup>1</sup> — The present paper gives the results of Mr. Loomis's observations made off Monterey, California, from Dec. 11, 1894, to Jan. 13, 1895. Forty-three species are formally noticed, of which 11 are Gulls of the genus *Larus* — probably a number not exceeded on any coast, at this or any other season. The annotations relate generally to the manner of occurrence of the various species, but in several cases include descriptions of little-known phases of plumage. The Ancient Murrelet (*Synthliborhamphus antiquus*) is reported as common, wintering in considerable numbers on the coast of California, although previously recorded as a California bird, as Mr. Loomis observes, apparently from only a single specimen taken off Monterey in January, 1874. Mr. Loomis also reports the Mew Gull (*Larus canus*) as apparently common on the California coast in winter, although its distribution in the second edition of the A. O. U. 'Check-List' is stated to be "Europe and Asia; accidental in Labrador?" Mr. Loomis calls attention, however, to a former record for California by Mr. Henshaw (Auk, II, p. 232).

Preceding the annotated list (pp. 2-14) Mr. Loomis presents and discusses the general facts of migration as observed in respect to the water birds of the California coast in winter. He brings into special prominence the evidence of a southward migration in winter to breeding grounds in the southern hemisphere of certain species of Shearwaters, and

<sup>1</sup> California Water Birds, No. II. Vicinity of Monterey in Midwinter. By Leverett M. Loomis, Curator of the Department of Ornithology in the California Academy of Sciences. Proc. Cal. Acad. Sci., Ser. 2, Vol. VI, 1896, pp. 1-30, with Map. (Feb. 21, 1896.)



from this proceeds to discuss the causes of migration in general, and the means by which birds are guided in their long migratory journeys. He discredits the possession by birds of a "mysterious sense of direction," believing they are guided by natural phenomena.

This paper is an excellent counterpart of his former paper, giving an account of his observations at the same locality during midsummer, 1894, the two together adding greatly to our knowledge of the movements, habits and relative abundance of the water birds of the California coast.  
—J. A. A.

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## GENERAL NOTES.

**Brünnich's Murre at Cape Charles, Virginia.**—Mr. Geo. S. Morris has in his collection a male Brünnich's Murre (*Uria lomvia*) taken Dec. 31, 1890, at Cape Charles, Va., and I have a female taken by myself at the same place on Dec. 14, 1895. As I do not find this bird in the Virginia list, these captures may be of interest, as it extends the range of this winter visitor. There had been a northeast storm for five days, and the specimen I took was either very tame or else exhausted, as it was shot without any trouble. The stomach was entirely empty and there was no fat on the body. Both of these specimens were fully identified by Mr. Witmer Stone of the Philadelphia Academy of Natural Sciences.—I. N. DEHAVEN, *Ardmore, Montgomery Co., Pa.*

**The Parasitic Jaeger near Cleveland, Ohio.**—Last November, while on a shooting trip to Sandusky Bay, I was told by a friend, Mr. A. E. Kelly, a local shooter, of two birds which he described as "web-footed hawks" that he had seen pursuing the Gulls and Terns. One of the pair he had already shot and sent to the Smithsonian Institution; the other he shot and sent to me a few days later, when I found it to be a female Parasitic Jaeger (*Stercorarius parasiticus*). Mr. Ridgway also found the specimen sent him to be of the same species.

This species is not included in Dr. Wheaton's list of Ohio birds in the report of the Geological Survey, but I find in the Proceedings of the Cleveland Academy of Science, in a paper read by Dr. Kirtland in November, 1857, an account of a bird taken near the mouth of Rocky River, Lake Erie, which he considers as probably of this species.

The specimen sent me had a minnow and a quantity of dark feathers in its stomach. Its skin is now in the collection of Case School of Applied Science.—F. M. COMSTOCK, *Cleveland, Ohio.*

**Puffinus tenuirostris, off San Diego, California.**—On Jan. 9, 1896, while collecting sea birds about three miles west of Point Laura Light-house, a number of dark Shearwaters were seen, that seemed to me to be much too small for *P. griseus*. They were usually single birds, though several times loose companies of from three or four to a half a dozen sailed by. They were very shy and after several ineffectual attempts to get a shot I gave them up. Just as I was starting for home, however, two birds appeared from opposite directions and lit near my boat, one on either side; both were secured and one proved to be an undoubted *P. tenuirostris*.

This species has not before been recorded on the Eastern Pacific south of British Columbia, although it extends along the coast of China to Australia on the Western Pacific. Several years ago I felt reasonably sure that I had seen *P. tenuirostris* along the coast of Southern California,

but as all of the dark specimens of *Puffinus* that I secured proved to be *griseus*, I had about concluded that I was mistaken.

I am now convinced that I was correct, and that the Slender-billed Shearwater, if not of regular occurrence, is periodically common along our Southwestern coast to Lower California.—A. W. ANTHONY, *San Diego, Cal.*

**The Skull of the Young Cormorant.**—The rapidity with which changes take place in growing birds has often been noted, and a remarkable instance of this is found in the Cormorants.

As is well known, Cormorants are among the best examples of desmognathous birds, premaxillaries, anterior palatines, and maxillo-palatines being completely fused. There is also no trace of narial openings in the adult and no hint of basi-ptyergoid processes. Yet the nestling of *Phalacrocorax urile* is schizognathous and holorhinal, the narial openings being large, while the sphenoid bears good-sized basi-ptyergoid prominences.

Any one who has the good fortune to be located near a Cormorant rookery has a splendid chance to ascertain just when the narial openings close, or, if he be charitably inclined, he might collect for the United States National Museum, which would furnish alcohol and a can, a series of young taken at short intervals from the time of hatching to the time of leaving the nest.—F. A. LUCAS, *United States National Museum, Washington, D. C.*

**Clangula hyemalis at San Diego, California.**—On January 13, Mr. L. Belding handed me a fine specimen of the Old-squaw that he had shot in the harbor of San Diego, but a few hours previously. He informed me that the bird was alone near one of the city wharves, no other ducks of any species being in the immediate vicinity.

This record somewhat extends the range of the species on the Pacific Coast, there being but few records for the State and none from south of Santa Cruz Island, where Mr. Belding informed me that a specimen was taken several years ago and recorded in Wheeler's Surveys West 100th Meridian.—A. W. ANTHONY, *San Diego, Cal.*

**Occurrence of Great White Heron at Escondido, California.**—A little while ago I accepted an invitation to see a Heron, which had been killed and mounted for a parlor ornament. I was told that the bird had been killed during April, 1895. It proved to be a fine specimen of the *Ardea occidentalis*.—J. MAURICE HATCH, *Escondido, Cal.*

**Note on the Flexor hallucis brevis in the Night Heron (*Nycticorax nycticorax naevius*).**—While dissecting the muscles of the foot of a Night Heron I was surprised to find that the *flexor hallucis brevis* was perforated at its insertion by the *flexor hal. longus*, thus becoming a *flexor perforatus dig. I*, similar to the *flexores perforati dig. II, III, IV*.

This perforation of the flexor h. brevis seems to be of a rather rare occurrence since Hans Gadow, in his great work on birds, forming part of Brown's 'Klassen und Ordnungen des Thier-reich's,' mentions only three genera, with this perforation of said muscle, namely, *Talegalla*, *Crex* and *Bucorvus*.

Though he refers to the fact that he found this muscle (fl. h. b.) exceedingly well developed in *Ibis*, *Grus* and *Ciconia*, he does not mention any perforation of said muscle, which he surely would have done, had he found it to be so.

In my specimen this muscle arises from about the proximal half of the *tarso-metatarsus*. In the middle of the tarsus it divides into *two* branches, or tendons which completely unite before their insertion on the phalanx<sup>1</sup> of the hallux. The flexor h. longus, which perforates the short flexor, is connected by a small vinculum with the 'flexor profundus' as in the majority of Ardeidæ. It certainly would be interesting to examine these flexores of the hallux in the other genera of the Ardeidæ.—ARTHUR RESLER, *Baltimore, Md.*

**Porzana noveboracensis near Ottawa, Canada.**—On the 22d of October, 1895, I shot a male Yellow Rail in a marsh some twenty-four miles from this city. This I think is the first specimen obtained in this vicinity.—GEO. R. WHITE, *Ottawa, Ontario, Canada.*

**Crymophilus fulicarius in Maine.**—It seems worth while to make a note of the capture of some recent specimens of the Red Phalarope (*Crymophilus fulicarius*) on the southwestern coast of Maine, not only because the bird is uncommon there, but because data as to the exact time of its occurrence are not at all full. An adult female in fine plumage was taken on Peak Island, Portland Harbor, on May 17, 1892, and is now in my collection. Two other specimens were sent to me in the flesh from York Beach, May 8, 1893.—HENRY H. BROCK, *Portland, Me.*

**Crex crex in Maine.**—The occurrence of *Crex crex* near Portland, Me., was noted in an editorial paragraph of the 'Ornithologist and Oölogist,' Vol. XV, p. 30, as follows: "H. H. Brock reports a specimen of the European Corn Crane (*Crex crex*) killed by John Whiting in Falmouth, Me., about four miles from Portland. Another was shot at the same time, but was so mutilated that it was thrown away."

I feel that the importance of this capture demands a more detailed statement, especially in view of the fact that the above notice seems to have been often overlooked. The bird is an unquestionable *Crex crex* in extremely fine plumage and of typical coloration. It not only agrees closely with printed descriptions, but with the several European specimens with which I have compared it. The date of its capture was October 14, 1889, and the locality the 'Dyke' Marsh in Falmouth, where so many other rare waders have been taken. It was shot by Mr. John Whit-

ney, — not "Whiting." It came into my hands at once, was preserved by myself, and is now in my collection. Great importance should not, of course, be attached to the closing sentence of the paragraph above quoted, which was based on the statements of a gunner not skilled in identifying birds, though undoubtedly truthful. — HENRY H. BROCK, *Portland, Me.*

**Baird's Sandpiper in Michigan.** — On August 20, 1895, Mr. Leon J. Cole and myself collected a female Baird's Sandpiper (*Tringa bairdii*) in Ottawa County, Michigan. This is the second or third, if not the first record of this bird's occurrence in the State. — W. E. MÜLLIKEN, *Grand Rapids, Mich.*

**Western Sandpiper** (*Ereunetes occidentalis*) **more abundant than the Semipalmated** (*E. pusillus*). — On Two-mile Beach, Cape May County, New Jersey, from the 1st to the 15th of September, 1895, I found both varieties of *Ereunetes* quite abundant in large flocks; and out of thirty-five specimens taken, twenty were unquestionably *occidentalis* and fifteen *pusillus*. The birds were all carefully measured and the colors noted. The bills of the so-called western variety varied from .87 to 1.07, males and females, ten measuring over 1.00, and the back of each was uniformly colored with a very reddish tinge.

The bills of the fifteen Semipalmated measured from .63 to .78, and were uniformly gray on the back, excepting three which had a slight tinge of red. I have never met with the western variety before, that is, to my knowledge, for it was only of late that I learned the difference, which is probably the excuse of many of us who otherwise might have found the bird just as common as I did. In the spring migration, and perhaps in the fall, I hope to look for it again.

Mr. Brewster mentions in 'The Auk' (Jan., 1889, p. 69) that a number of these birds (*occidentalis*) were taken by Mr. J. C. Cahoon on Monomoy Island, Mass., during July, August and September, 1888, and it may be that the bird is not nearly so accidental as it has been heretofore supposed. — WM. L. BAILY, *Philadelphia, Pa.*

**Woodpeckers' Tongues — a Plea for Aid.** — The tongues of our North American Woodpeckers are, as the readers of 'The Auk' well know, mostly barbed at the tip. Unless they have devoted some attention to the subject they may not, however, know that the tongue of young Woodpeckers are barbless, and that it is an interesting question just when the barbs make their appearance. The tongue of a full-fledged nestling of *Dryobates villosus*, a species whose tongue is remarkably well armed when adult, bears only fine reflexed hairs along the edge, and just at present no specimens are available to show when the barbs make their appearance. I should be greatly obliged to any readers of 'The Auk' who may collect any young Woodpeckers during the year, especially such as are about to leave, or have recently left the nest, if they will kindly send me the tongues. It



is an easy matter to save them when making a skin, and no preparation is necessary other than to allow the tongue to dry, as a little soaking will restore the tongue nearly to its fresh condition. — F. A. LUCAS, *U. S. National Museum, Washington, D. C.*

**Pinicola enucleator in Westchester County, N. Y.**—Some two miles northeast from Sing Sing, N. Y., on February 12, 1896, I shot a male Pine Grosbeak in high plumage. The bird was in one of a few pine trees in a considerable grove of cedars. Careful search in the vicinity failed to reveal others. — L. S. FOSTER, *New York City.*

**The Pine Grosbeak at Poughkeepsie, N. Y.**—The Pine Grosbeaks (*Pinicola enucleator*) have been very numerous in the grounds surrounding Vassar College, Poughkeepsie, this winter. They were attracted perhaps by the large number of spruce trees growing there which seem to offer them very palatable food. They have created quite a havoc among these trees. Early in the winter as I was walking among the evergreens, I found the snow literally carpeted with tips of the spruce trees and fragments of buds and seeds. On examining the twigs I found that the buds were eaten and that there were indications of pecking at the points of separation. I had never seen the ground so covered, and perceived at once that there was some unusual cause for such devastation. I looked about among the trees but saw only a pair of Kinglets, and I could not in conscience charge them with such wholesale destruction. I therefore suspected the Pine Grosbeaks, and my suspicion was later confirmed by my catching them in the very act. This flock has consisted almost entirely of young males and females, as is usually the case. One red male was noted early in January feeding with the flock, and later another was found dead.

The weather has not been continuously severe, and the ground has not been covered with snow more than a week at a time. The Grosbeaks are still here, March 13.

A Red-breasted Nuthatch (*Sitta canadensis*) has also been seen this winter. It is an uncommon visitant in this vicinity. — CAROLINE E. FURNESS, *Vassar College, Poughkeepsie, N. Y.*

**The Pine Grosbeak (*P. enucleator*) in New Jersey.**—On Sunday, March 8, 1896, while driving through Wortendyke, about two miles west from here, I saw two birds of this species in a fir tree by the roadside. There was no possibility of a mistake as I was within twenty feet and had a good view of them. They were either females or young males, and their thick bills and white wing bars were very noticeable. About an hour later, while in Allendale, I saw another of the same species in a small tree, bare of leaves, in a field adjoining the highway. Although I went over the same ground the two next following days I did not meet with any Pine Grosbeaks. — DELAGNEL BERIER, *Ridgewood, N. Y.*

**Abnormal Plumage of a Pine Grosbeak.**—On the 30th of December, 1895, I took a specimen of the female Pine Grosbeak (*Pinicola enucleator*) at Shelburne, N. H. On looking the bird over carefully I noticed an unbroken ring of feathers, like those of the upper back in color and texture, extending over the left shoulder, where the band measures .75 of an inch in width, and continuing across the breast and terminating on the right shoulder, its width having decreased .20 of an inch. The band is composed of thirty-three feathers, that is, beginning to count as soon as they are out of their normal position on the back, and are of much deeper slate color than those above or below them; the centre of each feather is tinged with chrome yellow and they are longer than the surrounding ones, standing out almost like a ruff. The flesh of the neck was perfectly normal and the bird apparently had never been injured. I have the specimen now in my collection.—REGINALD HEBER HOWE, JR., *Longwood, Mass.*

**The American Crossbill at Sea.**—Early on the morning of February 26, 1896, an American Crossbill (*Loxia curvirostra minor*), a female or dull-colored male, was found on the deck of the steamer 'Trinidad' bound for New York from the Bermudas. I saw the bird, which was in an exhausted condition, at eight o'clock, and was told that it had come aboard some time before that hour. The American coast must then have been about three hundred miles distant.

When the 'Trinidad' left Grassy Bay, late in the afternoon of February 24, there was little wind, nor was there much until noon of the day following, when it began to blow from the northeastward, freshening constantly, and developing into a gale before the bird came aboard.—JOHN CLIFFORD BROWN, *Portland, Me.*

**Harris's Sparrow in Spring Dress in Autumn.**—While out shooting on Nov. 1, 1895, I shot a Harris's Sparrow (*Zonotrichia querula*) in full spring plumage. It is a male bird of the year. It was in a large flock of Harris's Sparrows, but was the only one in spring plumage, all the others being in fall dress.—SIDNEY S. WILSON, *St. Joseph, Mo.*

**A Brown Thrasher (*Harporhynchus rufus*) in Massachusetts in Winter.**—On December 15, 1894, I discovered a Brown Thrasher in Arlington, Mass. I made my identification as sure as possible without shooting the bird, because I knew that the middle of December was later than this bird usually remains in Massachusetts. A few days after I first saw him, Mr. Walter Faxon, to whom I had reported my observations, again found the bird in almost exactly the same spot.

From Dec. 15 until Christmas, the bird was visited regularly, and he seemed to be able to supply himself with food; but on Dec. 27, there came the first heavy snowstorm of the winter, covering the ground with from four to five inches of snow, on top of which was a crust strong

enough to bear a man's weight. With this snow on the ground, it seemed probable that the Brown Thrush would be unable to get food enough to keep alive. Consequently, from Dec. 27 till March, we took food to him regularly, at least as often as twice a week. We gave him yellow corn meal soaked in water or milk for his staple diet. This food we sometimes varied with bread, pieces of meat cut fine, meal-worms, etc. He always ate whatever we gave him with a good appetite, as soon as we were a few yards off. By March 5, the snow had melted away in many spots, and we saw the bird for the last time on that day.

When at rest, he carried his left wing lower than the right. For this reason we supposed that he had been wounded in the wing, and so prevented from making the long autumnal migration. Whether or not he would have been able to take care of himself without outside help we have no means of knowing; but he ate what we brought him so eagerly, and so soon after we offered it to him, that it seemed probable that he got very little other food after the first heavy snowfall. — ARTHUR SCOTT GILMAN, Cambridge, Mass.

**A Few Notes from Maine.** — *Accipiter velox*. — On Aug. 17, while at Jackman, Me., I noticed a large flock of at least 150 Sharp-shinned Hawks flying southwards. The birds composing the flock were distributed over an area of perhaps three miles, and were not flying steadily along when seen. Some were flying, while others would light on the tops of trees along a roadside which ran in the general direction in which they were flying. After resting a few minutes they would resume their flight, passing other members of the flock that were resting, so that some of the birds were constantly on the wing. As it was very difficult to count them, I am sure that I underestimated rather than overestimated their numbers. It seems odd that they should have been flying southward so early in the season, and in such a large body.

*Pinicola enucleator*. — The Pine Grosbeaks are at present to be seen daily in the vicinity of Bangor, Me., and I believe they are present this winter in even greater numbers than were here three years ago in 1892-1893. The proportion of red males seems to be about one to every ten dull-colored birds. What is remarkable is the extremely early date at which I saw the first birds this fall. On Oct. 26, while hunting at Mud Pond, about ten miles from Bangor, I saw a flock of ten or fifteen Grosbeaks. To make doubly sure I shot two of them, but found, on coming to skin them, that they were moulting, and their feathers were so loose that it was impossible to save the skins. On dissection they proved to be young males. Their stomachs contained a mass of fir buds and seeds. They were next seen on Nov. 10, near Orono, about nine miles from Bangor, and presumably belonging to a different flock, as they were about five miles from the locality where the birds were previously seen. After this they were seen every few days, but I did not see any in the city of Bangor until the last week in December. From that time up to the present date, Feb. 17, I have

seen them in the city nearly every day. Their chief food seems to be the seeds of crab-apples, and mountain ash berries.

**Phalacrocorax dilophus.**—This species is not uncommon along the Maine coast, but it is rare in the interior of the State. We have in the Maine State College collection a specimen of the Double-crested Cormorant which was shot at Kingman, Penobscot County, Me., about Nov. 18, 1895, and presented to the college by Rev. J. W. Hatch. — O. W. KNIGHT, *Bangor, Maine.*

**Three Winter Notes from Longwood, Massachusetts.**—I noted a flock of nineteen White-throated Sparrows (*Zonotrichia albicollis*) on the 8th of December, 1895, and again on the 21st, when three specimens were taken, one adult and one immature male and one adult female. This flock remained in the locality of an old dump, among tree trunks and general rubbish,—a protected spot. I have noted this flock since the 8th and 21st on the following dates: December 22 and 25; January 2, only eight being then in the flock; January 19, three of the flock noted in a snow storm; three again on the 25th, and since this latter date they have entirely disappeared from the locality, the weather having not become, however, any more severe.

On the 16th of November I noted in the same locality a Winter Wren (*Troglodytes hiemalis*) and on the 25th shot, I think, the same bird. This is another record of the wintering of this species near Boston, Mass.

On the 25th of December, 1895, I also noted a male Chewink (*Pipilo erythrophthalmus*) in company with a flock of White-throats, mentioned above. He flew from a thicket and perched for a moment in the top of a pear tree, called *shewink* several times and disappeared. This is the first record I believe of *Pipilo erythrophthalmus* in Massachusetts during the winter. One was recorded at Portland, Connecticut, in January. Since writing the above I have learned from Mr. Brewster that a female Chewink was sent to him which was shot on January 2, in Bedford, Mass., some ten miles to the northwest of here. — REGINALD HEBER HOWE, JR., *Longwood, Mass.*

**Bird Notes from Erie County, New York.**—Among the rarer summer birds found near Springville, New York, may be mentioned the American Egret (*Ardea egretta*). A young bird of the year was taken on the Cataraugus Creek on August 10, 1881, by Mr. Depew of Long Island. The specimen is now in my collection.

The Horned Lark and State-colored Junco have been found to be regular breeders in this vicinity. The Larks lay their eggs about the first week in April and the Juncos build their nests the last of May. In the middle of June, 1895, the writer found the Junco breeding on the mossy slope of a woodland ravine only a few rods from the home of the Chewink, Rose-breasted Grosbeak, Indigo Bunting, and Scarlet Tanager; all these birds at the same time protesting against his invasion of their peaceful realm.

Further on in this favored woodland where the trees were scattered, but the underbrush dense, a pair of Mourning Warblers (*Geothlypis philadelphia*) were feeding their young; not far distant another pair had a nest full of fresh eggs concealed among the blackberry bushes and ferns beside a moss-covered log.

Near Springville the Hooded Warbler (*Sylvania mitrata*) was common. Nest and eggs of this species were taken here and at East Hamburg. The Black-throated Blue Warbler, Black-throated Green Warbler, Blackburnian Warbler, and Black and Yellow Warbler were all found in full-breeding dress and song. The nest and eggs of *Sylvania canadensis* were taken on the 5th of June; also a pair of the old birds and a young bird in full plumage the last of June, 1895.—ELAN HOWARD EATON, *Candaigua, N. Y.*

**Virginia Notes.**—My notes of a visit to Southwestern Virginia in the spring of 1895—April 24 to May 9—contain three or four items which may be worthy of record.

**Chondestes grammacus.**—On April 28, at Pulaski, I found a bird of this species feeding in grass-land, where it allowed me to watch it at my pleasure. Dr. Rives reports a single Virginia specimen as having been taken in Washington, and in 'The Auk' for January, 1896, Mr. William Palmer records a second specimen taken in August, 1895.

**Helminthophila chrysoptera.**—Of the species Dr. Rives mentions a single Virginia specimen, taken near Washington by Dr. Fisher. At Pulaski, I saw four or more individuals April 28 to May 1. On my last morning there (May 1), in a hurried visit of a few minutes to the edge of the woods near the hotel, I found two Golden-wings among a bevy of new arrivals of different species. The Warbler migration was still only beginning, and I had then little doubt that a longer stay would show the species to be pretty common. All my birds were males.

**Dendroica cærulea.**—This species marked by Dr. Rives as "accidental or very rare," seemed to be moderately common at Natural Bridge, where it frequented exclusively the tops of hills covered with old deciduous forest. I saw it first on May 4. Two days later a female was seen gathering nest materials, but a long hunt failed to find the nest itself. The males sang with the utmost freedom. On May 6 I found them thus engaged on four hilltops.

It may be worth adding that Red Crossbills (*Loxia curvirostra minor*) were seen or heard on four dates at Pulaski and Natural Bridge, and that I found a flock of five birds feeding at Arlington, in the national cemetery, on May 12.—BRADFORD TORREY, *Wellesley Hills, Mass.*

**On Birds reported as rare in Cook County, Ill.**—**Porzana noveboracensis.**—In Ridgway's Birds of Illinois, this species is given as not uncommon, but from the observations of Mr. J. G. Parker and myself the Yellow Rail is a quite common resident of Cook County. I have had no

difficulty in taking or seeing a number each spring at South Chicago along the Calumet River, and at Worth, Illinois, on the Feeder of the Des Plaines River.

While Mr. Chas. Roby and myself were collecting on his grounds at South Chicago, in the spring of 1890, his dog caught two Yellow Rails in less than one hour's time, bringing them to us between his lips alive and with not a feather ruffled.

**Macrorhamphus griseus.** — I have found this bird in Cook County when the season has been a very dry one, the favorite feeding grounds being Mud Lake, a small lake one mile south of Grand Crossing, Ill., a small pond at 126th Street, South Chicago, along the Calumet River, and on the Sag, at Worth, Ill. The bulk arrive in the months of July and August after the breeding season is over, in company with flocks of Yellow-legs, Pectoral, Least, and Semipalmated Sandpipers. The Dowitchers generally fly in flocks of from three to ten, and as a rule are young birds.

I have two specimens in the rich red plumage that I shot at South Chicago, May 6, 1893. This is the only instance that I can find of this bird in Cook County, prior to July. In the Chicago Academy of Sciences are two birds in the light plumage taken at Mud Lake, Aug. 12, 1893. Mr. J. G. Parker, Jr., has frequently taken *M. griseus* at Mud Lake.

**Macrorhamphus scolopaceus.** — I have two specimens of this bird in the breeding plumage, which I bought from a market shooter at South Chicago, May 6, 1893, on the same day that I shot my specimens of *M. griseus*.

**Micropalama himantopus.** — I have observed a large number of this species, and can positively say that they are a rare spring migrant, and a common fall visitant. It is very hard to distinguish them in the fall plumage from the young of *Totanus flavipes*. I have one in the breeding plumage taken at South Chicago, on the Calumet River, in April, 1890; also one in the light plumage taken at Mud Lake, Sept. 23, 1893. Mr. J. G. Parker, Jr., has a bright female taken from a flock of four at Mud Lake, July 25, 1893; also a young bird from the same locality.

On August 24, 1895, Mr. J. F. Ferry, of Lake Forest, Ills., and myself shot four Stilt Sandpipers from a flock of fifty or more at Libertyville, Ill., a pair of which are in the collection of the Chicago Academy of Sciences.

**Tringa maritima.** — I have a specimen of this bird taken at South Chicago in June, 1895. This with Dr. J. W. Velie's specimen, taken November 7, 1891, are the only records I can find of the Purple Sandpiper in Cook County.

**Tringa bairdii.** — Mr. J. G. Parker, Jr., has one of these birds taken at Mud Lake, August 22, 1893.

**Symphemia semipalmata.** — Mr. J. G. Parker, Jr., and myself have seen this bird on several occasions in Cook County but have failed to shoot one.

**Tryngites subruficollis.** — In the spring of 1890 I shot one of these birds from a flock of Golden Plovers at Worth, Ill. The specimen is in



the Museum of the Cook County Normal School. There is also one bird in the Chicago Academy of Sciences which I shot at Mud Lake, Sept. 18, 1893.

**Numenius longirostris.**—I observed one of this species at South Chicago, Ill., in June, 1890. It was in company with the flock of *C. squatarola* from which I shot my specimens. I have one bird which I obtained at Liverpool, Ind., about fifteen miles from South Chicago. Mr. J. G. Parker, Jr., saw a pair of Long-billed Curlews feeding on the lake shore at Woodlawn Park.

**Charadrius squatarola.**—In June, 1890, I shot two fine old males in full breeding plumage, from a flock of about fifteen, at South Chicago, one of which is in the collection of the State at Springfield, Ill. I have a fine large bird in the young plumage from Mud Lake, Oct. 29, 1893. Mr. J. G. Parker, Jr., and myself observed three of this species at Hyde Lake, Ill., in November, 1891.

**Arenaria interpres.**—On a number of occasions I have seen this bird at South Chicago, the Sag at Worth, Ill., and at Mud Lake. I shot a fine specimen at the latter place, Sept. 18, 1893. Mr. J. G. Parker records one from the beach of Lake Michigan at Woodlawn Park. It was in company with a flock of Sanderlings.—FRANK M. WOODRUFF, *Academy of Sciences, Chicago, Ill.*

**Additions to the Avifauna of Tennessee.**—The following species not included in the annotated list of Tennessee birds recently published by me in the 'Proceedings' of the Academy of Natural Sciences,<sup>1</sup> have come to notice. They comprise some which have been recorded in other publications of a non-scientific or inaccessible character. Further additions to this list will be gratefully acknowledged and recorded by the author. I am indebted to Mr. H. C. Oberholser for some of these references.

1. **Larus delawarensis.** RING-BILLED GULL.—Numerous at Open Lake, Landesdale County, in November 1895, where Mr. B. C. Miles procured a specimen, sending me the head and foot for identification.

2. **Otocoris alpestris subsp.?** HORNED LARK.—A skin of this bird is recorded in the 'First Annual [1893] Report' of the Museum of the Illinois Wesleyan University, page 16. It evidently belonged to a collection of bird-skins presented to the University by Prof. G. S. Thompson, of Nashville, Tenn., as announced on page 5 of the report.

3. **Spizella monticola.** TREE SPARROW.—A specimen is recorded on page 17 of the above-mentioned 'Report' and it is probably from the same source as the preceding.

4. **Dendroica castanea.** BAY-BREASTED WARBLER.—This and the following two species were observed by Mr. Bradford Torrey near Chattanooga and recorded in the 'Atlantic Monthly.' His first record for the

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<sup>1</sup>Contrib. Zool. Tenn., No. 2, Proc. A. N. S. 1895, pp. 463-501.

Bay-breast is from Lookout Mountain (l. c., 1895, p. 547) where he observed it May 7, 1895.

5. *Dendroica palmarum*. PALM WARBLER. — *Ibid.*, p. 547. Mr. Torrey considered the birds seen by him to be typical *palmarum*.

6. *Dendroica tigrina*. CAPE MAY WARBLER. — *Ibid.*, p. 547. Cameron Hill and Lookout Mountain.

7. *Cistothorus stellaris*. SHORT-BILLED MARSH WREN. — A skin from Tennessee is in the Illinois Wesleyan University collection ('Report,' l. c., p. 19).

8. *Turdus aliciae*. GRAY-CHEEKED THRUSH. — Mr. Torrey saw this bird on Walden's Ridge in Hamilton County (l. c., p. 610). — SAMUEL N. RHODES, *Philadelphia, Pa.*

**Sundry Notes.** — New London, Prince Edwards Island, Sept. 1, 1872. Mr. William Everett of Dorchester, Massachusetts, saw to-day a flock of about fifty Eskimo Curlew (*Numenius borealis*) which had that day landed in a field where a man was ploughing. This man informed him that they were very tame and had been following the furrows picking up and eating earth-worms. This Mr. Everett saw them do, after which he shot fifteen by walking up to them. On examination he found that all those shot were poor, having no fat.

Billingsgate, Cape Cod, Mass., April 27, 1895. Three Black-bellied Plovers, *C. squatarola*, the first this spring, noted to-day. On May 13, about one hundred seen all in one flock.

Mr. Frank Brown, of Chelsea, Mass., who sojourned at Charlotte Harbor, situated on the west coast of Florida, during the winter of 1888, informs me that there is in that neighborhood a small island on which are several dead trees, around the bases of which he noticed large heaps of good sized conch shells. Some of these heaps he should think were ten or twelve feet square. A portion of these shells appeared as if they had been there for years, while others were fresh looking. Inquiring of his boatman who was a resident of the place as to the cause, he was informed that the Eagles brought them there, pulled out the meat which they ate, dropping the shells.

*Anas obscura*. — Ponkapog Pond, Massachusetts, October 21, 1895. The first flock of migratory Black Ducks (eighteen in number) of the season came into the pond to-day, thirteen of which were killed. — GEORGE H. MACKAY, *Nantucket, Mass.*

## CORRESPONDENCE.

## Some Questions of Nomenclature.

EDITORS OF 'THE AUK':—

*Dear Sirs,*—Those of us who have to deal with fine points of scientific nomenclature will always be duly thankful to the A. O. U. Committee on Nomenclature for the 'Code' which was the result of their first labors, and which has now become the standard not only of our ornithologists and mammalogists but of most other American zoölogists and botanists as well.

Occasionally, however, knotty questions present themselves for which we find no ruling in the Code, and each author is compelled to decide for himself, which results in great diversity of opinion. On some of these questions a careful study of the 'Check-List' shows that the A. O. U. Committee did form their decision, but unfortunately did not include the reasons therefor in the Code, nor give us any of the arguments in the case.

I therefore wish to call especial attention to one or two points in the hope that we may come to a little more definite understanding of them and perhaps elicit an explanation from the A. O. U. Committee giving the reasons for their rulings.

The first question is in regard to the quotation of authorities for manuscript names.

For instance, an author, Smith, discovers a new bird for which he proposes a name and prepares a description, then finding that another author, Jones, is about to publish a paper on allied birds, he sends his manuscript for Jones to incorporate in his paper. Or perhaps Smith merely sends a specimen bearing the new name which he would propose and calls attention to its most distinctive characters, leaving Jones to prepare the description in his own words. In either case Jones gives Smith credit for the new species by placing his name after the scientific name as authority for it. Now the question is, are we in quoting the name to cite Smith, the *author* of the species, or Jones the publisher of it, as our authority.

Those who would quote Jones claim that the first one to publish a diagnosis of the species is the author to be quoted, because until the description is published the name is a *nomen nudum*, and that the author of the manuscript name is not authority for the description published by the other. Furthermore, by quoting the author of the MS. name we give no clue to the place of publication, which is one of the principal reasons for quoting an authority.

On the other hand, it is claimed that we have no right to ignore the author of the MS. name, as he really recognized the species as new and deserves the 'credit'; moreover, the author who published the description

(Jones) distinctly disclaimed credit for the species by quoting 'Smith' along with the scientific name at the head of the description.

The mere question of 'credit' is of but little importance to my mind, for more real 'credit' belongs to the man who prepares a good monograph of a group whether he hands his name down to posterity as a sort of caudal appendage to a lot of new species or not. A form warranting description should be described by all means, but this is not the end of zoölogical science, as some seekers after new species seem to think.

If both sides were consistent in the above argument we might decide in favor of one or the other, but they are not.

So far as my experience goes representatives of both sides recognize two classes of MS. names. (1) In which Smith prepares the entire diagnosis as well as proposes the name and Jones prints the whole bodily in his paper. (2) Where Smith has merely attached his new name to a specimen and called attention to some of its characters, leaving Jones to prepare the diagnosis.

In case (2) the advocates of the publisher as the authority to be cited quote Jones, but in case (1) I find most of them would quote Smith.

Now for my part I fail to see how we can in practice draw a line between these two classes of MS. names, and how we are to tell which author had the most to do with framing a description.

Moreover, inclined though I am to the citing of the publisher of the name, I do not think that the MS. author can be wholly ignored where all the work is his and where the publisher has merely acted as editor for him, and distinctly disowns the species as his own. Such action would cause the greatest overthrow of authorities in invertebrate zoölogy where MS. names are much more frequent.

The clearest way out of the difficulty seems to me to be the quotation of both authors in all cases thus: "Smith" Jones,<sup>1</sup> which indicates exactly the status of the authority and is very little more trouble to write. This practice, too, will be much more likely to be generally adopted than the citation of either name separately, especially in view of the great diversity of opinion which now exists among zoölogists in general.

The action of the A. O. U. Committee in regard to this question is interesting and further illustrates the diversity of opinion, at the same time showing how unstable the authorities quoted in our list are likely to be. In the first edition of the Check-List there are some twenty instances of 'MS.' names; in four of these the Committee decided to adopt as authority the name of the author who published the description, while in all the rest they ruled in favor of the author of the MS. name. The latter seemed to be their general rule while the first four cases were regarded as pure *nomina nuda* before the descriptions appeared. In some

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<sup>1</sup> I do not claim any originality in suggesting this form of citation, as I am well aware that it has been often used. I merely advocate this form as preferable to either name separately or to such a form as, Smith MS. Jones.

of the latter, however (especially *Rallus saturatus* "Hensh."), it is hard to see where the author of the MS. name had any claim over those of the first four cases.

In the Supplements to the Check-List the Committee continued to rule in favor of the author of the MS. name, but in the new edition which has just appeared they reversed their ruling, changing the authorities for a number of names, and have almost universally ignored the MS. author and quoted the publisher.<sup>1</sup> In two instances, however, the 'MS. author' still receives recognition, *e. g.*, *Pipilo chlorurus* (Townsend) and *Otocoris alpestris pallida* Townsend.

The first of these is described as *Fringilla chlorura* in Audubon's Orn. Biog., V, p. 336. The entire description is a quotation from a letter of Dr. J. K. Townsend, but the name is not credited to him and is not in quotation marks: it is clearly Audubon's and without it the description would have no status. Ord, in Guthrie's 'Geography,' gave names to descriptions in the History of Lewis and Clarke's Expedition, and we do not quote Lewis and Clarke; so far as I see the two cases are parallel.

*Otocoris alpestris pallida* was discovered, described and named by Mr. C. H. Townsend, and I presume his manuscript was in the U. S. Government Printing Office early in 1890, or perhaps before. However, Mr. Townsend lent his type to Dr. Dwight when he was preparing his monograph of the American Horned Larks, and another description was prepared and printed in Dr. Dwight's paper (Auk, April, 1890, p. 154).

Mr. Townsend's description did not appear till September, 1890 (judging from the date on which the paper was distributed). Dr. Dwight very properly disclaimed any credit for the name and gave it as "Townsend MS.," and in the A. O. U. Check-List it is credited to Townsend.

The reference, moreover, is that of Townsend's publication (Proc. U. S. Nat. Mus., 1890, p. 138), and Dr. Dwight's apparently earlier publication is ignored. While I do not begrudge Mr. Townsend his Lark, and would still give him full credit for it on the plan advocated above, I fail to see why the Committee should make this special ruling.

While discussing the rulings in the new Check-List I would like to call attention to one or two instances which I take to be typographical errors, though perhaps there may be some reasons for them that I have overlooked.

No. 13a. *Fratercula arctica glacialis* (Temm.) is printed identically in the two editions, but the reference to Temmink's work is omitted in the new edition, and Stephens, Gen. Zool. 1826, given as the place of original publication; should not the authority be changed to Stephens?

An exactly similar case is 766a. *Sialia sialis azurea*, still credited to "Swains.," though the place of original publication is changed to "Baird, Rev. Am. B., July, 1884, p. 62," and no reference to Swainson appears.

<sup>1</sup> This makes Gambel the authority for *Callipepla gambelii* or indicates that he named the bird after himself, which he certainly did not intend to do!

Another point is in regard to quoting the authority for species described in the 'Fauna Boreali-Americana.'

The A. O. U. Committee has evidently decided to quote the author whose initials appear at the head of the description immediately following the scientific name instead of the two authors jointly. *Oidemia americana*, however, is still credited to "Sw. and Rich.," although it is Swainson's species and no reference to Richardson occurs in connection with it. Two other species, *Lagopus leucurus* and *Larus franklinii*, credited to "Sw. and Rich.," are still regarded as of joint authorship though both could easily be credited to Richardson without stretching rulings applied in other cases.

The other main point to which I wish to call attention is one of priority. Two names are proposed in the same volume for the same animal, one having priority of nineteen pages. Several specialists claim that in such a case the next writer to revise the group to which the animal belongs has the right to adopt either name he chooses, and subsequent writers should follow him. I should like to know if such a ruling is in accordance with views of the A. O. U. Committee. To me the priority of a few pages seems to warrant the adoption of the first name just as much as priority of a few years, or, as it has been happily put, "in case of twins, primogeniture rules."

I was impelled to call especial attention to the main points discussed in this letter by the question of the proper name for the Polar Hare recently agitated by Mr. S. N. Rhoads (see Amer. Nat., 1896, p. 251), and I am indebted to this gentleman for the use of some letters from specialists bearing upon the matter.<sup>1</sup>

The citation of this case, with the opinions of various specialists, will further illustrate the different views that are held in regard to these questions. Ross published a description of the Polar Hare in his 'Voyage,' Appendix IV, p. 151, giving it the name "*Lepus arcticus* Leach," implying that Dr. Leach had recognized the species as new and had proposed this name for it. Farther on in Appendix No. IV is a more minute account by Dr. Leach of the animals collected; here (p. 170) he describes the Polar Hare, giving it the name *Lepus glacialis*, having apparently changed his mind as to what he would call it since communicating with Ross.

Sabine, Baird and others chose to adopt *Lepus glacialis* Leach for the animal, but now Mr. Rhoads advocates *Lepus arcticus* on account of priority and would quote as authority "Leach" Ross in accordance with the suggestion given above in this letter.

In answer to inquiries the following gentlemen have given their opinions as below in regard to which name and authority they would quote.

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<sup>1</sup> The permission to publish their opinions was courteously granted by the gentlemen mentioned below, to whom I am also indebted.



*Lepus arcticus* Ross.

Dr. L. Stejneger.

Dr. T. S. Palmer.

*Lepus glacialis* Leach.

Dr. C. Hart Merriam.

Mr. Gerrit S. Miller, Jr.

*Lepus arcticus* Leach, Ross.

Dr. Theo. Gill.

*Lepus arcticus* "Leach" Ross.

Prof. H. A. Pilsbry.

Mr. S. N. Rhoads.

Mr. Witmer Stone.

If only one authority is to be quoted Dr. Gill and Prof. Pilsbry would adopt *Lepus arcticus* Leach, and Mr. Miller, if deciding the case first hand (without regard to Baird, Sabine, etc.), would adopt *Lepus arcticus* Ross.

Finally, I must apologize for using so much of your valuable space, but feel that these questions should be brought into prominent notice, for while they do not appeal to the field ornithologist, they must have presented themselves to every systematist who has had occasion to discuss points of nomenclature.

Very truly yours,

WITMER STONE.

*Acad. Nat. Sciences, Phila.,*

March 3, 1896.

[Mr. Stone, in a private letter accompanying the above, has kindly suggested my following his communication with such remarks as may seem to me pertinent. In doing so I wish to be understood as writing for myself alone and not in behalf of or by the authority of the A. O. Committee on Nomenclature, although what I say in reference to the points raised by Mr. Stone is, I believe, strictly in line with the decisions of the Committee.

First in regard to MS. names, or Mr. Stone's 'Smith and Jones' case. As Mr. Stone has shown, there are two well-defined classes of manuscript names. There are also cases which do not clearly come under either.

1. Under class 1 we may place (a) names borne on the label of a museum specimen, or (b) transmitted by means of a labelled specimen from one naturalist to another. Out of courtesy, or for some other reason no more obligatory, Jones, the publishing author, adopts Smith's name and writes after it 'Smith MS.' In this case Jones is the authority for the name, and Smith gets his 'credit' for his discovery, which will appear to the end of time in every full citation of the bibliography of the species.

The justness of this is easily demonstrated. Jones is the responsible party in the case. He is the arbiter as to whether Smith's supposed new species is really tenable. In case he finds it a 'good species' he is at

liberty to adopt Smith's name or not, as he chooses. If he finds Smith's species is not a 'good species' it is his duty to suppress it altogether, thus doing Smith the kindness of concealing his mistake, and benefiting science by suppressing a synonym.

2. Under class 2 we may place MS. names, transmitted from one naturalist to another, accompanied with a diagnosis. Jones, the publishing author, receives from Smith not only a labelled specimen, but a diagnosis of the new species it is supposed to represent. Jones publishes the name and the diagnosis as inedited matter, credited to Smith, with such additional comment as he sees fit, endorsing or discrediting the species as his judgment may dictate. In this case Smith is the author and Jones merely the vehicle of publication, and the citation will be "Smith, in Jones, etc." (= title of the publication). Or, as sometimes happens, instead of transmitting specimens, Smith may send merely the name and diagnosis for incorporation in Jones's monograph; in which case, or in either case, Jones's responsibility for Smith's species extends only so far as relates to his good judgment in accepting Smith's matter for publication.

On this supposition, Jones publishes Smith's diagnosis as well as his name, and both in such a way as to indicate Smith's authorship. Should Jones fail to do this, and there is nothing to show Smith's claim, we can recognize only the ostensible author; the equity of the case is purely a personal matter between Smith and Jones.

In certain cases one may have reason to suppose that the author of the MS. name furnished something more than a MS. name attached to a specimen,—in fact in rare instances many know this to be the case: but it would be fatal to stability in the matter of authorities for names if we allowed such knowledge or conviction to supercede what the record shows on its face, since this alone is the evidence open equally to every one.

All cases of MS. names should be placed under one or the other of the two classes already defined, but the decision may be less easy in some cases than in others. An instance in point is the case of "*Fringilla chlorura* Towns., in Aud. Orn. Biog.," etc., cited above by Mr. Stone. It is evident that all Audubon knew of the bird was derived from the account furnished him in a letter by Mr. Townsend; the whole account, except the name, is given as a quotation from Townsend. Townsend may have given it the name also, but of this there is no proof. The name as it stands is ostensibly Audubon's. Yet all subsequent writers have attributed it to Townsend, and apparently the A. O. U. Committee followed custom without subjecting the case to special scrutiny. Now that my attention is specially drawn to it, I see no way of escaping the decision that, in strict accordance with the rule applied in other cases in the revised edition of the Check-List, the name is Audubon's, and the citation should be *Fringilla chlorura* Audubon.

In the case of "*Otocoris alpestris pallida* Townsend," it seems unavoidable to accept Mr. Stone's correction, as Dr. Dwight's paper was published

about April 1, 1890, and Mr. Townsend's, as shown by the official list of dates of publication of the articles in Vol. XIII of the Proceedings of the U. S. National Museum (see p. viii of this volume), not until Sept. 9, 1890. Yet Dr. Dwight says Mr. Townsend "has recently described a race from Lower California and kindly permitted me to examine his type," being under the impression, doubtless, that Mr. Townsend's paper was already in press. The facts in the case as now developed render it evident that the correct citation is: *Otocoris alpestris pallida* Dwight (ex Townsend MS.), Auk, VII, April, 1890, p. 154.

In the first edition of the A. O. U. Check-List, as Mr. Stone has pointed out, there was lack of uniformity in the treatment of MS. names, as also in a few other nomenclatural matters, defects it was sought to remedy in the second edition; but, as in all things of human origin, there is lack of perfection even in the revised edition, but the inconsistencies are few and wholly accidental.

The case of "*Fratercula arctica glacialis* (Temm.)," as it appears in the revised edition, is a puzzle. Obviously if the amended reference is correct, "Stephens" should replace "Temm." as the authority for the name *glacialis*. On reinvestigation, however, it turns out that the change introduced in the revised edition was uncalled for and erroneous, the original edition being correct.<sup>1</sup>

As regards "*Sialia azurea* Swain.," the name as used by Swainson "is a complete *nomen nudum*" (cf. Ridgw., Man. N. Am. Birds, p. 581, first footnote), and was first coupled with a description by Baird in 1864. Therefore the authority is Baird and not Swainson.

In regard to the 'Fauna Boreali-Americana,' it was the ruling of the Committee that the author of the species, whether Swainson or Richardson, or the two authors jointly, should be cited as the authority for the name, each case to be determined on its merits by the evidence afforded by the text. But the evidence is not always clear, so that different authorities might decide the same case differently. In the case of new species either Richardson's or Swainson's name is usually given as the authority. In the case of *Lagopus leucurus*, "Swains." is given as the authority for the name, but the description is signed "R." So it was deemed proper to cite both Swainson and Richardson as the authority.

The authority for *Larus franklinii* is "nobis"; the text is signed "R."

<sup>1</sup> Temminck says: "On doit observer de ne pas confondre notre *Marmon fratercula* [= *Fratercula arctica* (Linn.)] avec une espèce propre aux côtes septentrionales d'Amerique, dont le plumage est absolument semblable, mais qui a la bec beaucoup plus haut, elle a surtout la mandibule inférieure très-arquée; cette espèce nouvelle est indiquée par le docteur Leach, sous le nom de *Mormon glacialis*" (Man. d'Orn. sec. éd., II, 1820, p. 933). On reference to Stephens it becomes evident that Dr. Leach's name was merely a museum manuscript name, whence both Temminck and Stephens obtained it.

but one of the footnotes is signed "Sw.," and the diagnosis is not signed (as it is in some other cases, but not in all).

In the case of "*Oidemia americana* Sw. and Rich.," the proper authority is obviously Swainson, and that it was not so printed in the revised Check-List is clearly due to oversight.

In regard to the priority of names published in the same volume, Mr. Stone will find this point treated under Canon XVII of the A. O. U. Code, to the effect that of names of equal pertinency, "that is to be preferred which stands first in the book."

As to the case of *Lepus arcticus*, I should agree with Mr. Rhoads and write *Lepus arcticus* Ross, or, in making a full or formal citation, *Lepus arcticus* "Leach" Ross. *Lepus glacialis* is clearly untenable, *arcticus* having precedence of 19 pages in the same volume. Even if Leach imparted the name *arcticus* to Ross, he had no right to change it later on the ground that he preferred *glacialis*, since "an author has no right to change or reject names of his own proposing, except in accordance with rules of nomenclature governing all naturalists" (cf. A. O. U. Code, Canon XXXV). The case of *Lepus arcticus* Ross, therefore, rests entirely on the adequacy of Ross's accompanying description, which, if sufficient (I have not the description at hand), clearly renders the name *glacialis* untenable.<sup>1</sup>—J. A. ALLEN.]

#### A Question of Nomenclature.

TO THE EDITORS OF 'THE AUK':—

Dear Sirs,—The publication by Mr. Anthony, in the January number of 'The Auk,' of a new subspecies of *Dryobates*, under the appellation *Dryobates villosus montanus*, involves a principle of nomenclature in regard to which it may be profitable to invite the opinions of systematists, and upon which a decision by the A. O. U. Committee seems desirable.

*Picus montanus* of Brehm (Vögel Deutschlands, 1831, p. 189) is now relegated to the synonymy of *Dendrocopos* (= *Dryobates*) *major* (Linn.); and the question arises whether or not the specific term *montanus* is available for further employment in the genus *Dryobates*. Canon XXXIII of the A. O. U. Code, which is presumed to provide for such contingencies reads: "... a specific or subspecific name is to be changed when it has been applied to some other species of the same genus, or used previ-

<sup>1</sup> Professor Baird (Mam. N. Am., 1857, p. —) says he does not see why the name *arcticus* Ross is not tenable, having priority, but not being able to consult the work in question he follows Sabine in the use of *glacialis* Leach. I find that in 1877, with the work before me, I gave precedence to *arcticus* Ross.

ously in combination with the same generic name." If the first clause above quoted be not subject to ambiguous interpretation, it seems evident that a new name will be required for the form now known as *Dryobates villosus montanus* Anthony.

Since, however, it is maintained by some that absolute identity of both generic and specific terms is considered necessary for the rejection of a scientific name as a synonym, in other words, that a distinction is to be made between the genus of nomenclature and the genus of zoölogy, it is hoped that there may be elicited from members of the A. O. U. Committee statements of their views respecting the rule to be applied in cases like the present.

Very truly yours,

HARRY C. OBERHOLSER.

Washington, D. C.

[Mr. Oberholser having kindly invited me to give my opinion on the above case, I take the liberty of submitting the following, as merely my individual ruling on the question.

According to my interpretation of Canon XXXIII of the A. O. U. 'Code,' there is no conflict between Anthony's name *Dryobates villosus montanus* and Brehm's *Picus montanus*, for the simple reason that they are not homonyms. A species name necessarily consists of two elements, a generic and a specific, both being essential components of the name. This is explicitly stated in Canon X of the A. O. U. Code, which affirms that the two names, the specific and the generic, "together" constitute the "technical name of any specifically distinct organism." That this view was in the mind of the Committee in framing Canon XXXIII is evident from the argument and illustrations given under it in favor of extending the maxim "Once a synonym [or homonym] always a synonym [or homonym]" to specific and subspecific names.

To pursue further the case cited by Mr. Oberholser, *Picus montanus* Brehm is a pure synonym of *Picus major* Linn., and the name *montanus* had never been coupled with *Dryobates* prior to Mr. Anthony's combination of the two terms,—that is, so far as we know, and for the sake of the illustration, let it be granted that they have not. These names are then not homonyms, and can never come in conflict. But let us suppose that *Picus montanus* Brehm really represents a good species, authors hitherto to the contrary notwithstanding, and that it is referable to the genus *Dryobates*. In that case whoever restores the species must adopt for it the name *Dryobates montanus* (Brehm), and Anthony's name, having been given later, must be replaced by a new name; but the change is not to be made until the necessity therefor arises. In nine cases out of ten, like this of Anthony and Brehm, it is safe to say the necessity for a change would never arise. Hence it would be highly unwise to adopt a rule, in view of the constantly changing limits and values of genera, that would

require the specific element of a species name to be changed whenever, under the vicissitudes of name shifting, it was brought under the same generic name as an earlier similar specific element of a species name which had never been combined with the same generic element. To be obliged to be constantly on the alert for homonyms is bad enough, but this is a triviality in comparison to the task of hunting out all previous combinations that might possibly associate the specific element of a name with other and entirely different generic combinations, to say nothing of the enormous element of uncertainty it would introduce into the matter of stability of names through the purely personal element that is constantly operative in changing the limits of genera. Finally, I know of no code of nomenclature that provides for or requires a change of a species name under conditions like those cited by Mr. Oberholser.—  
J. A. ALLEN ]

'Ord's Zoölogy' Again.

TO THE EDITORS OF 'THE AUK':—

*Dear Sirs.*—In the Introduction to my Reprint of 'Ord's Zoölogy' (1894, p. viii) it is stated that the only copy of this part of the second American (1815) edition of Guthrie's 'Geography' previously known to authors had mysteriously disappeared from the library of the Academy of Natural Sciences of Philadelphia. While searching for some references in a bound volume (No. 1a) of General Natural History Tracts at the Academy, I lately chanced upon this missing copy of a rare and historic bit of literature. The separate is the last (No. xvii) of this volume of Tracts. On the upper margin of the first page of the brochure (p. 291) is written in lead pencil the autograph signature, "George Ord," and in lead pencil, apparently in another person's<sup>1</sup> writing, "from Guthrie's Geography, Phil. Edition." In ink, in Cassin's hand, follow the words, "Guthrie Geog. Philada. 1815." The separate probably had originally attached to it, page 290, containing the introductory paragraph, and the last leaf containing page 261, on which Ord's contribution ends, but neither of these leaves are preserved. Owing to some oversight the "author's" reference to this tract in our card catalogue contained no data to indicate anything further than its former existence in the library, and misled by this, it was supposed, after a fruitless search, that it had been irretrievably lost. On finding the tract, however, it was discovered that the full reference and data had been entered in the 'subject' catalogue under "Natural History of the United States" and so it escaped notice.

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<sup>1</sup>Dr. E. J. Nolan declares this to be the handwriting of John Cassin, and a careful comparison with Cassin's letters strongly supports this view.



It is due the librarian of the Academy to state that the irregularity in cataloguing resulted naturally from the absence of Ord's name on the separate as the authoritative author and to the fact that the main page heading of the tract reads "United States of America."

SAMUEL N. RHODES.

*Acad. Nat. Sci. Phila.*,  
March 3, 1896.

*Chen hyperborea* and *C. nivalis*.

TO THE EDITORS OF 'THE AUK':—

Dear Sirs,—I am desirous of ascertaining the status of *Chen hyperborea et nivalis* east of the Mississippi River, and therefore request that all members of the Union and readers of 'The Auk' that have specimens of these forms in their collections from the territory in question will favor me with the following data: locality where taken, date, sex and measurement,—length and wing.

WILLIAM DUTCHER.

525 *Manhattan Ave.*,  
*New York City*.

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NOTES AND NEWS.

DR. WILLARD LORRAINE MARIS, an Associate Member of the American Ornithologists' Union, died at the German Hospital in Philadelphia, December 11, 1895. Dr. Maris was a graduate of the University of Michigan, and shortly before his death, from typhoid fever and pneumonia, was appointed resident physician at the hospital where he died. He was a young man of fine education and exceptional abilities, and was much interested in natural history, devoting special attention to ornithology. He was a son of Prof. L. Maris of Newtown, Bucks County, Pennsylvania.

THE DELAWARE VALLEY ORNITHOLOGICAL CLUB held its annual meeting at the Academy of Natural Sciences, Philadelphia, on January 2, 1896. The annual reports showed a continuance of the prosperous condition of the Club as reported last year, while the membership list shows a decided increase. Among the communications of the past year

may be mentioned the following: 'Food Birds of the Eskimo,' Dr. Wm. E. Hughes; 'Summer Birds of the Pennsylvania Coal Region,' R. T. Young; 'Nesting Habits of the Parula Warbler in Cape May Co., N. J.,' M. L. C. Wild; 'Ornithological Notes from the Diary of William Bartram,' Witmer Stone; 'Birds of Tennessee,' S. N. Rhoads; 'Winter Birds of Cape Charles, Va.,' G. S. Morris; 'Some Notes on the Extermination of the Wild Pigeon,' Wm. L. Baily.

The officers of the Club for the ensuing year are President, Dr. Wm. E. Hughes; Vice-President, I. Norris De Haven; Secretary, Charles J. Rhoads; Treasurer, Wm. L. Baily.

THE MICHIGAN ORNITHOLOGICAL CLUB held three meetings during the last quarter. January 12, Mr. A. B. Durfee read an interesting paper on the Short-billed Marsh Wren (*Cistothorus stellaris*), based on nearly half a century's experience; and Mr. W. E. Mulliken presented a paper on Evolution. February 14, Mr. L. J. Cole read a paper entitled 'Winter Experiences,' and Mr. Mulliken gave a talk on Migration. March 13 Mr. T. L. Hankinson presented a paper entitled 'Winter Notes,' and Mr. H. F. Jones a paper on the Prairie Horned Lark. A neatly printed Constitution has been issued and a copy sent to all observers in the State. At the meeting of February 14, a committee composed of L. Whitney Watkins, W. Earle Mulliken, and Thos. L. Hankinson, was appointed to prepare a migration schedule and to take up the study of bird migrations in Michigan. The blanks (similar to those used by the Department of Agriculture) have been printed and a copy sent to every observer in the State or near its borders. The membership of the Club now numbers forty, and is evenly distributed over the State. Persons interested in the work of the Club should address the Secretary, W. Earle Mulliken, at 191 First Ave., Grand Rapids, Mich., for particulars.

THE publishers, the J. B. Lippincott Company of Philadelphia, announce a "second edition, thoroughly revised," of Mr. Ridgway's 'Manual of North American Birds.' The prospectus states that this new edition of the 'Manual' "has been carefully revised to the close of 1895, and includes the characters of over one hundred species and six genera which have been added to the North American fauna since 1887. Various errors in the first edition have been corrected, several of the analytical keys having been entirely rewritten." Directions are given for the use of the keys, and marginal references in the body of the work refer to the additional matter in the appendix.

D. APPLETON AND COMPANY of New York have brought out a third edition of Mr. Chapman's 'Handbook of Birds of Eastern North America.' A few errors that escaped rectification in the second edition are here corrected, but no essential changes are introduced.

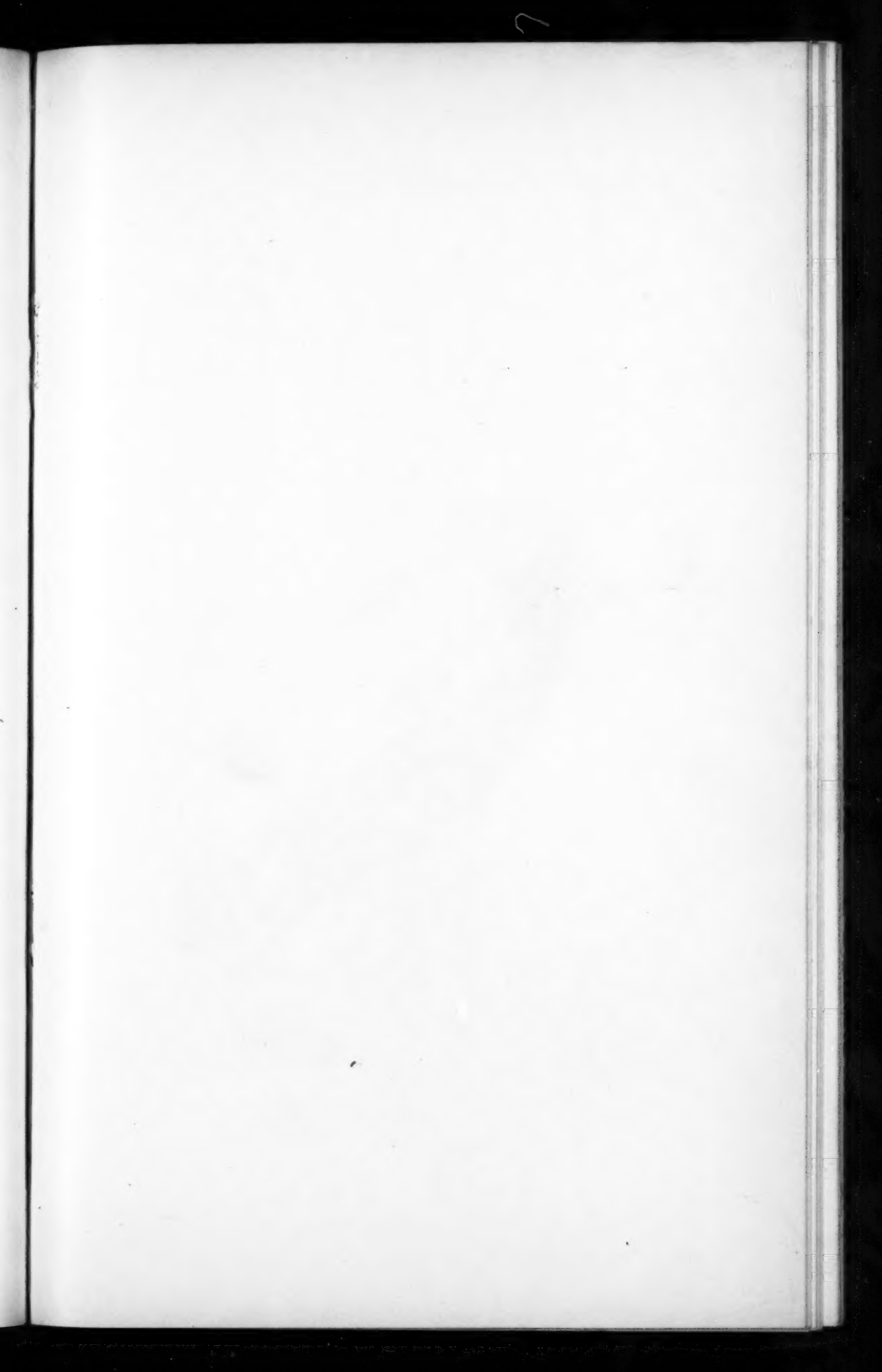
WE HAVE received Vol. I, No. 4, Jan. 1896, of 'The Feather,' a monthly journal devoted to "Poultry, Pigeons, Birds, etc.," published by George E. Howard & Co., Washington, D. C. It has a department devoted to "Cage Birds and Wild Birds," conducted by Dr. F. H. Knowlton of the U. S. National Museum. The January issue contains several pages of ornithological miscellany, contributed by Dr. Knowlton, including an article on 'The Great Auk, an Extinct Bird of much Renown,' illustrated with cuts of the bird, its skeleton, and its egg.

IN AN article in 'Nature' (Feb. 20, 1896), Dr. R. Bowdler Sharpe gives an account of 'The Seebohm Collection' of birds received by the British Museum as a bequest from the late Mr. Henry Seebohm. Incidentally Dr. Sharpe sketches the growth of the Ornithological Department of the British Museum during the last twenty-five years, from a collection of about 40,000 specimens to its present status of the "finest in the whole world." The principal accessions are enumerated, and their distinctive features stated. These are the Wallace, Gould, Sclater, Shelley, and Sharpe collections; the magnificent Hume collection; the Tweeddale collection; and the great Salvin-Godman American collection. Nearly all have been donations from their former public-spirited and distinguished owners. Until the reception of the Seebohm collection, the birds of Europe and northern Asia were poorly represented. "By the splendid bequest of Mr. Seebohm," says Mr. Sharpe, "this vacuum in our Palæarctic collections has been filled, though there is no one in the Museum who does not feel that this addition to the strength of its ornithological section has been attained only through the loss of one of the truest friends of the institution which his dying wishes have enriched. There has not yet been time to register and incorporate the specimens of the Seebohm collection, but we know that we have now received the principal collection of Palæarctic birds of modern times." Some years since Mr. Seebohm presented to the British Museum his collection of eggs. This latest gift includes "the Swinhoe collection of Chinese birds, the Prior collection of Japanese birds, the series of specimens obtained by Holst in the Bonin and Loo-Choo Islands, and Formosa; and last but not least, his own European and Siberian collections, the result of his travels in all parts of Europe, and of his expeditions to the valleys of the Petchora and the Yenesei." Also his great collections of Charadriidæ and Thrushes, the former the basis of his work on the 'Geographical Distribution of the Charadriidæ,' the latter of his contemplated 'Monograph of the Turdidæ, or Family of Thrushes.' It is certainly pleasant to know that the ornithological treasures accumulated by Mr. Seebohm have been deposited where they will be not only duly appreciated but will contribute so effectively to the progress of ornithological research.

THE FIELD COLUMBIAN MUSEUM has sent a Natural History Expedition into Central Africa, under the leadership of the Curator of Zoölogy, Mr. D. G. Elliot. Mr. Elliot sailed from New York about the last of February, and the details of his plans -- the particular part of the country to be visited, etc. -- were to be determined by information and advice obtained in London. As he takes with him the skilled taxidermist collector, Mr. E. Akeley, as his chief assistant, and is well provided with funds and necessary equipments, it may be naturally expected that the expedition will secure an ample harvest. Mr. Elliot will make special efforts to secure as many species of the Antelopes, many of which are rapidly nearing extinction, and other large South African mammals; not neglecting of course to gather in ornithological material when possible to obtain it. Mr. Elliot expects to remain in the field till December.

MR. FRANK M. CHAPMAN is spending a two months' vacation in Yucatan, where he finds that the ancient Aztec ruins rival in interest the mammals and birds.

As this page goes to press several ornithological publications have come to hand, some of which it seems desirable to mention. We have received, for instance, Part XIII of Mr. Nehrling's 'Birds of North America.' Also Mr. Cory's 'Hunting and Fishing in Florida' which should have plenty of interest for both the sportsman and naturalist, and particularly the ornithologist, as the latter half is devoted to a formal account of the Water Birds of Florida and very fully illustrated with cuts prepared especially for the work.





A. H. B. & Co. Lithographers, Baltimore.

EVERMANN'S PTARMIGAN (*LAGOPUS EVERMANNI*.)